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ELEMENTS

OF THE

PHILOSOPHY

OF

THE HUMAN MIND.

BY

DUGALD STEWART.

REVISED AND ABRIDGED,
WITH CRITICAL AND EXPLANATORY NOTES,
FOR THE USE OF COLLEGES AND SCHOOLS.

BY FRANCIS BOWEN,
ALFORD PROFESSOR OF MORAL AND INTELLECTUAL PHILOSOPHY IN HARVARD COLLEGE.

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PREFACE.

THOUGH Dugald Stewart has not added many new truths to the Philosophy of Mind, and has hardly attempted to solve its more abstruse and intricate problems, he has done much to render it intelligible, popular, and useful. He is a great master of clear, harmonious, and ornate diction, which often rises into eloquence, and never fails to impart interest and animation to the least promising portions of his subject. But refined taste and elegant scholarship are among the least of his merits; the doctrines which he inculcates are those of vigorous common sense and sound morality, never deformed by a love of paradox, and never compromising the interests of truth by straining after novelty, or by unseasonable attempts to appear ingenious and profound. The principles of social order and good government, and the great interests of virtue and religion, were never more impressively taught, or eloquently defended, than by this professor of Scotch metaphysics, who had the honor to reckon among his pupils many who have since attained the highest distinction in the walks of science, literature, and statesmanship. His writings, though he modestly says of them that they are "professedly elementary," have been more generally studied than those of any English author upon the same subject during the last half century; and it is a striking proof of their merits, and of the spirit of candor and amiability which is manifested in them, that they have never been assailed by harsh or vindictive criticism. Those who controverted his opinions have always spoken of him with much respect, while his disciples appear to have regarded him, especially towards the close of his long and useful life, with affectionate veneration.

His principal work, "The Elements of the Philosophy of the Human Mind," has been frequently republished in this country, and has been much used as a text-book of instruction in metaphysical science in our colleges and schools. When applied to such a purpose, however, it must be admitted that it has many redundancies and some defects. The style, with all its merits, is somewhat diffuse, the digressions are numerous, and the illustrations and citations from other authors, more copious than the subject requires, or than the patience of the reader will always warrant. I have pruned these superfluities with great freedom, my purpose being to leave the statement of doctrine and the course of the argument encumbered with no more extraneous matter than seemed necessary for the entertainment of the pupil. Mr. Stewart's caution in the statement of his opinions may appear excessive, and it occasionally betrays him into vagueness of expression and a kind of indirect style, which leaves his meaning to be ascertained rather by inference, than from the obvious import of the language. He also takes for granted the reader's acquaintance with the writings and opinions of his more celebrated contemporaries and predecessors, thus leaving many blanks to be filled by those who are not particularly conversant with philosophical studies. I have endeavored to supply some of these deficiencies in the notes; but wishing not to swell the dimensions of the book, and at the same time to make it contain as much as possible of Stewart's own speculations, I have preferred silently to omit those passages which stood in great need of annotation, instead of introducing them with a commentary which should seem disproportioned in amount to the text. But these abridgments have been very carefully made, and I hope it will be found that they do not mar the continuity of the work, or leave any gaps which may create obscurity.

Whatever I have added to this edition, either in the text or the notes, is inclosed in angular brackets, [ ], so that the reader may easily distinguish Mr. Stewart's words from those of his commentator. For the convenience both of teachers and learners, I have also given a sort of analysis and abstract of the doctrines and arguments of the author, by prefixing to many of the paragraphs a brief statement, in italic type, of the subject to which it relates, or of the point which it is designed to prove. These headings of the sections are not inclosed in brackets, being sufficiently indicated by their nature, and by the change of type. Italics have also been freely used in the body of the work, in order to direct the student's attention to the particular words or sentences which contain the gist of the paragraph;—a precaution which diffuse and digressive writers may often profitably adopt, in order that their readers may never be at a loss to know what they are driving at.

The first portion of Mr. Stewart's "Elements" was published in 1792; and "after an interval of more than twenty years," he presented to the public the second volume. It was less successful than its predecessor, as the subject of which it treats is more abstruse and forbidding than the former theme, and not so well adapted to the author's peculiar tastes and powers. The researches and speculations of later writers, moreover, especially of Sir John Herschel, Mr. J. S. Mill, and Dr. Whewell, have deprived this later volume, in great part, of the interest and importance which it formerly possessed. I have, therefore, made comparatively little use of it in this abridgment, omitting the latter half of it altogether, and striking out large portions of the first two chapters. Mr. Stewart's own annotations, a double tier of which accompanies, and almost exceeds in quantity, the text, have also been diligently winnowed and bolted, so that they are reduced to a small portion of their primitive bulk. Translations are given of the Latin, Greek, and French citations, the original being often removed to make room for them.

The following extract from Mr. Stewart's Preface to his second volume, is a sufficient indication of the purpose for which this abridgment of the whole work has been prepared. The book, he says, "is more particularly intended for the use of academical students; and is offered to them as a guide or assistant, at that important stage of their progress when, the usual course of discipline being completed, an inquisitive mind is naturally led to review its past attainments, and to form plans for its future improvement. In the prosecution of this design, I have not aimed at the establishment of new theories; far less have I aspired to the invention of and new *organ* for the discovery of truth. My principal object is to aid my readers in unlearning the scholastic errors which, in a greater or less degree, still maintain their ground in our most celebrated seats of learning; and by subjecting to *free*, but I trust, not *skeptical* discussion, the more enlightened though discordant systems of modern logicians, to accustom the understanding to the unfettered exercise of its native capacities. That several of the views opened in the following pages appear to myself original, and of some importance, I will not deny; but the reception these may meet with, I shall regard as a matter of comparative indifference, if my labors be found useful in training the mind to those habits of reflection on its own operations, which may enable it to superadd to the instructions of the schools, that higher education which no schools can bestow."

While these sheets were passing through the press, the second volume of Sir William Hamilton's very handsome edition of "The Collected Works of Dugald Stewart" was received in this country. It contains the *first* volume of "Elements of the Philosophy of the Human Mind," corresponding to the first seven chapters of the present work. I have examined it with care, in the hope of finding some new matter which might be added to this volume. But this hope was disappointed. The additions are insignificant in extent and importance; they would not fill a page, and consist merely of some additional references and brief citations from other authors. Indeed, Sir William Hamilton says in the Preface, "there has been nothing added by me, in the view of vindicating, of supplementing or confirming, of qualifying or criticising, Mr. Stewart's doctrines." He also remarks, that though the volume was often reprinted during the author's lifetime, after the second edition in 1802, "no alteration or amplification, — none certainly of any consequence, has been hitherto incorporated" with it. Some "intended additions were indeed supplied," when the third volume was published, in 1827; and he observes that "these have only now been entered in their proper places." Of course, he here refers only to editions published in Great Britain; as these additions were "entered in their proper places" in an *American* edition published several years ago, from which the present volume was printed. As the Preface states that Mr. Stewart was not satisfied with the translations of quotations not in English, which were made for the Boston edition of 1821, it is proper to add, that these quotations have been translated anew for this volume. They are not translated at all in Sir William Hamilton's edition.

CAMBRIDGE, September 25, 1854.

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INTRODUCTION.

PART I.

OF THE NATURE AND OBJECT OF THE PHILOSOPHY OF THE HUMAN MIND.

Why the Philosophy of the Human Mind has hitherto made little progress.—The prejudice which is commonly entertained against metaphysical speculations, seems to arise chiefly from two causes: *First,* from an apprehension that the subjects about which they are employed are placed beyond the reach of the human faculties; and, *secondly,* from a belief that these subjects have no relation to the business of life.

The frivolous and absurd discussions which abound in the writings of most metaphysical authors, afford but too many arguments in justification of these opinions; and if such discussions were to be admitted as a fair specimen of what the human mind is able to accomplish in this department of science, the contempt, into which it has fallen of late, might with justice be regarded as no inconsiderable evidence of the progress which true philosophy has made in the present age. Among the various subjects of inquiry, however, which, in consequence of the vague use of language, are comprehended under the general title of *Metaphysics,** there are some, which are essentially distinguished from the rest, both by the degree of evidence which accompanies their principles, and by the relation which they bear to the useful sciences and arts; and it has unfortunately happened, that these have shared in that general discredit into which the other branches of metaphysics have justly fallen. To this circumstance is probably to be ascribed the little progress which has hitherto been made in the PHILOSOPHY OF THE HUMAN MIND;—a science so interesting in its nature, and so important in its applications, that it could scarcely have failed, in these inquisitive and enlightened times, to have excited a very general attention, if it had not accidentally been classed, in the public opinion, with the vain and unprofitable disquisitions of the schoolmen.

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* [The term *Physics* comprehends the various branches of Physical or Natural Philosophy, such as Chemistry, Mechanics, Astronomy, Botany, etc. It properly denotes the *science of things actually existing,* whether those

In order to obviate these misapprehensions with respect to the subject of the following work, I have thought it proper, in this preliminary chapter, *first*, to explain the nature of the truths which I propose to investigate; and, *secondly*, to point out some of the more important applications of which they are susceptible.

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things are material or immaterial; but it is usually confined to things material, and thus signifies *the science of the external world.* After Aristotle had written books upon various branches of Physics, he composed certain other treatises, to which he gave the name of *Metaphysics,* or things coming *after Physics.* In its widest signification, therefore, the term Metaphysics comprehends every study or science which does not belong to Physics. It is *the science of pure ideas, or of abstract and universal truths;* the objects of this science lie beyond the range of the senses, and are not attainable by experience. That every event must have a cause — that *qualities* or attributes presuppose a *substance* in which they inhere — that the human will is free, etc., are propositions which belong to Metaphysics. By many writers, however, the word Metaphysics is loosely applied to denote the Philosophy of Mind. Such a Philosophy treats of the Association of Ideas, Memory, Attention, and other phenomena of mind; and as it consists only in collecting facts and making inductions, it is properly an experimental science, and ought to be ranked under the head of Physics rather than of Metaphysics. *Psychology* is the latest term in use to denote the science of *mental* phenomena, while Physics, in its narrower signification, comprehends only *material* phenomena; the one is the philosophy of mind, the other is the philosophy of matter.]

Our notions both of Matter and Mind are merely relative.— The notion we annex to the words, matter and mind, as is well remarked by Dr. Reid, (in his Essays on the Active Powers of Man,) are merely relative. If I am asked, what I mean by *matter?* I can only explain myself by saying, it is that which is extended, figured, colored, movable, hard or soft, rough or smooth, hot or cold;—that is, I can define it in no other way than by enumerating its sensible qualities. *It is not matter, or body, which I perceive by my senses; but only extension, figure, color, and certain other qualities, which the constitution of my nature leads me to refer to* SOMETHING, *which is extended, figured, and colored.* The case is precisely similar with respect to *mind.* We are not immediately conscious of its existence, but *we are conscious of sensation, thought, and volition; operations, which imply the existence of* SOMETHING *which feels, thinks, and wills.* Every man, too, is impressed with an irresistible conviction, that all these sensations, thoughts, and volitions, belong to one and the same being; to that being, which he calls *himself;* a being, which he is led, by the constitution of his nature, to consider as something distinct from his body, and as not liable to be impaired by the loss or mutilation of any of its organs.

Proof of the separate existence of Mind.— From these considerations, it appears, that *we have the same evidence for the existence of mind, that we have for the existence of body;* nay, it there be any difference between the two cases, that we have stronger evidence for it; inasmuch as the one is suggested to us by the subjects of our own consciousness,* and the other merely

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* [*Consciousness* is usually defined to be *the notice which the mind takes of its own operations.* If I think or remember, I *know,* or *am conscious,* that I think or remember; if I am pained or pleased, I *know* that I am so pained or pleased. Thus, Consciousness is the witness or reporter of all mental phenomena, just as the senses witness and report the phenomena of the external universe. Consciousness reports the *present* phenomena of mind, as memory reports its *past* phenomena.

By most writers, Consciousness is spoken of as if it were a separate faculty of mind, whose special office it is to take cognizance of whatever is passing within us. But Dr. Thomas Brown, Mr. James Mill, Sir W by the objects of our perceptions: and in this light, undoubtedly, the fact would appear to every person, were it not, that, from our earliest years, the attention is engrossed with the qualities and laws of matter, an acquaintance with which is absolutely necessary for the preservation of our animal existence. Hence it is, that these phenomena occupy our thoughts more than those of mind; that we are perpetually tempted to explain the latter [the phenomena of mind] by the analogy of the former [the phenomena of matter], and even to endeavor to refer them to the same general laws; and that we acquire habits of inattention to the subjects of our consciousness, too strong to be afterwards surmounted, without the most persevering industry.

If the foregoing observations be well founded, they establish the distinction between mind and matter, without any long process of metaphysical reasoning:* for if our notions of both are

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Hamilton, and others, justly object to this doctrine. Having a sensation, and being *conscious* of that sensation, are not two things; the thing is one, the names only are two. If I say *I feel a sensation,* the expression is tautological, for the *feeling* and the *sensation* are the same thing; the sensation *is* the feeling. And to say *I am conscious of a feeling,* is merely to say that *I feel it;* to have a feeling is to be conscious, and to be conscious is to have a feeling. A single perception is simple and indivisible; it cannot be analyzed into a fact *and* the consciousness of that fact, for the event itself being an act of knowing, it does not exist, if it be not known to exist. See Sir W. Hamilton's *Discussions on Philosophy,* 2d. ed. p. 47. James Mill's *Analysis of the Human Mind,* I. p. 170. Bowen's *Essays,* p. 131. Dr. T. Brown's *Lectures on the Philosophy of the Human Mind,* I. pp. 244–261.]

* In stating the relative notions which we have of mind and of body, I have avoided the use of the word *substance,* as I am unwilling to furnish the slightest occasion for controversy; and have contented myself with defining *mind* to be *that which* feels, thinks, wills, hopes, fears, desires, etc. That my consciousness of these and other operations is necessarily accompanied with a conviction of my own existence, and with a conviction that all of them belong to one and the same being, is not an hypothesis, but a fact; of which it is no more possible for me to doubt, than of the reality of my own sensations or volitions.

[*Substance* is *the unknown something* which underlies and supports all *the qualities* by which any thing is made known to us. We can define any particular body only by saying, that it is *something* which is extended, colored, merely relative; if we know the one only by such sensible qualities as extension, figure, and solidity; and the other, by such operations as sensation, thought, and volition; we are certainly entitled to say, that matter and mind, considered as objects of human study, are essentially different; the science of the former resting ultimately on the phenomena exhibited to our senses; that of the latter, on the phenomena of which we are conscious. Instead, therefore, of objecting to the scheme of materialism, that its conclusions are false, it would be more accurate to say, that its aim is unphilosophical. It proceeds on a misapprehension of the proper object of science; the difficulty which it professes to remove being manifestly placed beyond the reach of our faculties. Surely, when we attempt to explain the nature of that principle which feels and thinks and wills, by saying that it is a *material* substance, or that it is the result of *material* organization, we impose on ourselves by words; forgetting, that matter as well as mind is known to us by its qualities and attributes alone, and that we are totally ignorant of the essence of either.*

The Philosophy of Mind susceptible of cultivation and progress.— It would probably contribute much to accelerate the progress of the philosophy of mind, if, (1.) a distinct explanation were given of its nature and object; and if, (2.) some gen-

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hard or soft, hot or cold, etc.; that is, by enumerating those properties or attributes, by means of which it manifests itself to our senses. So we can define *mind* only by saying, that it is *something* which feels, thinks, remembers, conceives, etc.; that is, we enumerate the qualities or faculties through which it manifests itself in consciousness. In both cases, this unknown *something* is called *substance,* which word, in plain English, means that which *stands under,* or *upholds,* its various qualities.]

* Some metaphysicians, who appear to admit the truth of the foregoing reasoning, have further urged, that for any thing we can prove to the contrary, it is possible, that *the unknown substance* which has the qualities of extension, figure, and color, may be the same with *the unknown substance* which has the attributes of feeling, thinking, and willing. But besides that this is only an hypothesis, which amounts to nothing more than a mere possibility, even if it were true, it would no more be proper to say of *mind,* that it is *material,* than to say of *body,* that it is *spiritual*

eral rules were laid down, with respect to the proper method of conducting the study of it.

Upon a slight attention to the operations of our minds, they appear to be so complicated, and so infinitely diversified, that it seems to be impossible to reduce them to any general laws.*

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* [What are *general laws*, or *laws of nature*, as they are generally termed? Few phrases are more frequently and glibly used than these, yet, in the minds of most persons, they have but a vague and uncertain signification. It is worth while, then, to attempt to gain some clear and precise notions respecting them.

A *law of nature* is nothing more than a *general fact*, or rather, *a general statement comprehending under it many similar individual facts.* A *law* is the result of a *classification*, and individual things are classed together on account of some similarity or uniformity that has been discovered between them.

1. *Objects that exist* are classed together on account of their *resemblance* to each other. Such classification may consist of several successive steps, and is the proper work of Natural History. Thus, all objects whatsoever are divided into three great kingdoms, the Animal, the Vegetable, and the Mineral. The Animal kingdom is subdivided into four classes, Vertebrates, Molluscs, Articulates, and Radiates or Zoöphites. Again, Vertebrates are divided into Mammifers, Birds, Reptiles, and Fishes. All the animals ranked under any one of these classes agree with each other in certain respects; all Vertebrates, for instance, have a vertebral column inclosing a spinal cord; all Birds have an apparatus, or the rudiments of an apparatus, for flying. The *General Fact*, that all the animals so classed possess the given organ or property, is called a *Law of Nature.* It is a Law of Nature, for instance, that all Vertebrates have a spinal cord and a skull inclosing a brain; it is also a Law, that all Mammifers and Birds have warm red blood, and a heart composed of four compartments. Another Law of Nature is, that every animal is produced from an egg. These Laws are not necessary and immutable truths, but are mere inductions founded on experience; they hold good only until an instance is discovered to the contrary. Whales were once classed with Fishes; they are now properly ranked with Mammifers, because unlike Fishes, they suckle their young. It was once supposed to be a Law of Nature, that all swans are white; black swans have since been discovered.

2. *Events that take place*, also, are classed together on account of their *uniformity*. Thus, it is a General Fact, or Law of Nature, that pressure on a fluid is propagated equally in all directions, and that a heavy body, if unsupported, falls to the earth. Many of these General Facts are so familiar, that we never think of formally enunciating them; "no science,'

In consequence, however, of a more accurate examination, the prospect clears up; and *the phenomena*, which appeared, at first,

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says J. S. Mill, " was needed to teach men that food nourishes, that water drowns, or quenches thirst, that the sun gives light and heat, that bodies fall to the ground." These laws, also, are not necessary truths, but are founded on mere induction,—often on a not very extensive one. A newly discovered metal, being found, by a single experiment, to be fusible at a certain temperature, it is at once declared to be a Law of Nature, that it does melt, always has melted, and always will melt, at the ascertained degree of heat. It is certainly possible, though not probable, that another piece of the metal should be discovered which will not melt at this temperature; such an instance would be only a parallel to the case of the black swans. A particular event, comprehended under the statement of a Law, is not properly said to be *caused by the Law*, but only to be *a case*, or instance, *happening under the Law*. A cow does not suckle its calf *because* it is a Mammifer, but it is called a Mammifer because it suckles its calf. So, it is not a law of Hydrostatics which causes water to remain at the same level in the two arms of a bent tube; but the fact, that the water stands at this level, is ranked among many other facts, which are comprehended under the general statement, *called a Law*, of Hydrostatics. Gravitation does not make the stone fall, but the particular fact, that this stone fell, is comprehended under the General Fact, *or Law*, of Gravitation. In like manner, Gravitation does not make the earth revolve in an elliptical orbit round the sun; but the fact, that the earth revolves in this manner, is ranked with the falling of a stone, and with many other facts *of a similar character*, under the general statement, or Law, of Gravitation.

Hence it is abundantly evident, to adopt Mr. Mill's language, that " the expression, Laws of Nature, *means* nothing but the uniformities which exist among natural phenomena, when reduced to their simplest expression." The Laws of Nature *do not account for*, or *explain*, the phenomena of nature; they only *describe* them. Description and classification are the sole employments of Physical science.

To account for, or explain, the operations of nature, we must have recourse to *Metaphysics*— to something *after*, or *above*, nature. We must ascend to the notion of *Cause*. The maxim, " *every event must have a cause*," is not, like the so-called Laws of Nature, a mere induction, founded on experience, and holding good only until an instance is discovered to the contrary; it is a necessary and immutable truth. It is not derived from observation of natural phenomena, but is superimposed upon such observation by a necessity of the human intellect. It is not made known through the senses; and its falsity, under any circumstances, is not possible—is not even conceivable. The *Cause*, to which it points us, is not to be found *in* to be too various for our comprehension, are found to be *the result of a comparatively small number of simple and uncompounded faculties, or of simple and uncompounded principles of action.* These faculties and principles are the *general laws* of our constitution, and hold the same place in the philosophy of mind, that the general laws we investigate in physics, hold in that branch of science. In both cases, the laws which nature has established are to be investigated only by an examination of facts; and in both cases, a knowledge of these laws leads to an explanation of an infinite number of phenomena.

In the investigation of physical laws, it is well known that our inquiries must always terminate in some general fact, of which no account can be given, but that such is the constitution of nature. After we have established, for example, from the astronomical phenomena, the universality of the law of gravitation, it may still be asked, whether this law implies the constant agency of mind; and (upon the supposition that it does) whether it be probable that the Deity always operates immediately, or by means of subordinate instruments? But these questions, however curious, do not fall under the province of the natural philosopher. It is sufficient for his purpose, if the universality of the fact be admitted.

The case is exactly the same in the philosophy of mind. When we have once ascertained a general fact; such as, the various laws which regulate the Association of Ideas, or the dependence of Memory on that effort of the mind which we call Attention; it is all we ought to aim at, in this branch of science. If we proceed no further than facts for which we have the evidence of our own consciousness, our conclusions will be no less certain, than those in physics; but if our curiosity leads us to attempt an explanation of the Association of Ideas, by certain

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nature. The mere Physicist, after vainly searching, ever since the world began, for a single instance of it, has at length abandoned the attempt as hopeless, and now confines himself to the mere *description* of natural phenomena. The *true cause* of these phenomena must be sought for in the realm, not of *matter*, but of *mind.*]

supposed vibrations, or other changes, in the state of the brain; or to explain Memory, by means of supposed impressions and traces in the sensorium; we evidently blend a collection of important and well-ascertained truths, with principles which rest wholly on conjecture.*

The Analogy of Matter no Guide to the Philosophy of Mind. — Beside this inattention to the proper limits of philosophical inquiry, other sources of error, from which the science of physics is entirely exempted, have contributed to retard the progress of the philosophy of mind. Of these, the most important proceed from that *disposition* which is so natural to every person, at the commencement of his philosophical pursuits, *to explain intellectual and moral phenomena by the analogy of the material world.*

I before took notice of those habits of inattention to the subjects of our consciousness, which take their rise in that period of our lives when we are necessarily employed in acquiring a knowledge of the properties and laws of matter. In consequence of this early familiarity with the phenomena of the material world, they appear to us less mysterious than those of mind; and we are apt to think that we have advanced one step in explaining the latter, when we can point out some analogy between them and the former. It is owing to the same circumstance, that we have scarcely any appropriated language with respect to mind, and that the words which express its different operations, are almost all borrowed from the objects of our senses.* It must, however, appear manifest, upon a very little reflection, that as the two subjects are essentially distinct, and as each of them has its peculiar laws, the analogies we are pleased to fancy between them, can be of no use in illustrating either; and that it is no less unphilosophical to attempt an explanation of Perception, or of the Association of Ideas, upon mechanical principles; than it would be to explain the phenomena of gravitation, by supposing, as some of the ancients did, the particles of matter to be animated with principles of motion; or to explain the chemical phenomena of elective attractions, by supposing the substances among which they are observed, to be endowed with thought and volition. — The analogy of matter, therefore, can be of no use in the inquiries which form the object of the following work; but, on the contrary, is to be guarded against, as one of the principal sources of the errors to which we are liable.

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* [" When I speak," says Crousaz, in his Art of Thinking, " of *desire, contentment, trouble, apprehension, doubt, certainty,* of *affirming, denying, approving, blaming,* — I pronounce words the meaning of which I distinctly understand; and yet I do not represent the things spoken of under any image or corporeal form. While the intellect, however, is thus busy about its own phenomena, the imagination is also at work in presenting its analogical theories; but so far from aiding us, it only misleads our steps and retards our progress. Would you know what *thought* is? It is precisely that which passes within you when you think. Stop but here, and you are sufficiently informed. But the imagination, eager to proceed further, would gratify our curiosity by comparing it to *fire,* to *vapor,* or to other active and subtile principles in the *material* world. And to what can all this tend, but to divert our attention from what *thought* is, and to fix it upon what it is not? "]

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* ["If we critically examine any language, ancient or modern, and trace its several terms or phrases to their source, we shall find it hold invariably, that all the words made use of to denote spiritual and intellectual things, are in their origin metaphors, taken from objects of sense. This shows evidently, that the latter [objects of sense] have made the *earliest* impressions, have by consequence first obtained names in every tongue, and are still, as it were, more present with us, and strike the imagination more forcibly than the former [spiritual and intellectual things.]

Campbell's *Philosophy of Rhetoric,* Book III. Chapter i. 3.

Numberless instances might be given; but a very few will suffice. *Imagination* is derived from an optical *image; acuteness,* from a Latin word signifying the *sharpness* of a material instrument; *reflection,* from *bending back* a ray of light; *apprehension* originally meant *seizure,* or *taking hold of* something *by* the hand; *instil* means to *drop into; spirit* is *breath; animal* and *animation,* (anima, *ἄνεμος*) come from *breath,* and ultimately from *wind; melancholy* means *black bile; faint-hearted* and *milk-livered* have come to mean *cowardly,* and *hard-hearted* to mean *cruel; understanding, foresight, inclination, penetration,* etc., suggest their own etymology.]

PART II.

OF THE UTILITY OF THE PHILOSOPHY OF THE HUMAN MIND.

Connection of the Arts and Sciences with each other. — It has been often remarked, that there is a mutual connection between the different arts and sciences; and that the improvements which are made in one branch of human knowledge, frequently throw light on others, to which it has apparently a very remote relation. The modern discoveries in astronomy and in pure mathematics have contributed to bring the art of navigation to a degree of perfection formerly unknown. The rapid progress which has been lately made in astronomy, anatomy, and botany, has been chiefly owing to the aid which these sciences have received from the art of the optician.

Although, however, the different departments of science and of art mutually reflect light on each other, it is not always necessary either for the philosopher or the artist to aim at the acquisition of general knowledge. Both of them may safely take many principles for granted, without being able to demonstrate their truth. A seaman, though ignorant of mathematics, may apply, with correctness and dexterity, the rules for finding the longitude. An astronomer or a botanist, though ignorant of optics, may avail himself of the use of the telescope or the microscope.

These observations are daily exemplified in the case of the artist; who has seldom either inclination or leisure to speculate concerning the principles of his art. It is rarely, however, we meet with a man of science who has confined his studies wholly to one branch of knowledge. That curiosity, which he has been accustomed to indulge in the course of his favorite pursuit, will naturally extend itself to every remarkable object which falls under his observation, and can scarcely fail to be a source of perpetual dissatisfaction to his mind, till it has been so far gratified as to enable him to explain all the various phenomena which his professional habits are every day presenting to his view.

All the sciences and all human employments connected with the science of mind. — As every particular science is in this manner connected with others, to which it naturally directs the attention, so all the pursuits of life, whether they terminate in speculation or action, are connected with that general science which has the human mind for its object. The powers of the understanding are instruments which all men employ; and his curiosity must be small indeed, who passes through life in total ignorance of faculties which his wants and necessities force him habitually to exercise, and which so remarkably distinguish man from the lower animals.* The phenomena resulting from these

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* [" 'T is evident," says David Hume, "that all the sciences have a relation, greater or less, to human nature, and that, however wide any of them may seem to run from it, they still return back by one passage or another. Even *mathematics, natural philosophy,* and *natural religion,* are in some measure dependent on the science of man; since they lie under the cognizance of men, and are judged of by their powers and faculties. It is impossible to tell what changes and improvements we might make in these sciences, were we thoroughly acquainted with the extent and force of human understanding, and could explain the nature of the ideas we employ, and of the operations we perform in our reasonings.

"If, therefore, the sciences of mathematics, natural philosophy, and natural religion, have such a dependence on the knowledge of man, what may be expected in the other sciences, whose connection with human nature is more close and intimate? The sole end of *logic* is to explain the principles and operations of our reasoning faculty, and the nature of our ideas; *morals* and *criticism* regard our tastes and sentiments; and *politics* consider men as united in society, and dependent on each other. In these four sciences of logic, morals, criticism, and politics, is comprehended almost every thing which it can any way import us to be acquainted with, or which can tend either to the improvement or ornament of the human mind.

"Here, then, is the only expedient from which we can hope for success in our philosophical researches; to leave the tedious, lingering method which we have hitherto followed; and instead of taking, now and then, a castle or village on the frontier, to march up directly to the capital or centre of these sciences, to human nature itself; which being once masters of, we may everywhere else hope for an easy victory. From this station, we faculties and principles of the mind, are every moment soliciting our notice, and open to our examination a field of discovery as inexhaustible as the phenomena of the material world, and exhibiting not less striking marks of divine wisdom.

While all the sciences and all the pursuits of life have this common tendency to lead our inquiries to the philosophy of human nature, this last branch of knowledge *borrows its principles from no other science whatever.* Hence there is something in the study of it which is peculiarly gratifying to a reflecting and inquisitive mind, and something in the conclusions to which it leads on which the mind rests with peculiar satisfaction. Till once our opinions are in some degree fixed with respect to it, we abandon ourselves, with reluctance, to particular scientific investigations; and, on the other hand, a general knowledge of such of its principles as are most fitted to excite the curiosity, not only prepares us for engaging in other pursuits with more liberal and comprehensive views, but leaves us at liberty to prosecute them with a more undivided and concentrated attention.

Direct advantages of a study of the phenomena of mind.—It is not, however, merely as a subject of speculative curiosity that the principles of the human mind deserve a careful examination. The advantages to be expected from a successful analysis of it are various; and some of them of such importance, as to render it astonishing, that, amidst all the success with which the subordinate sciences have been cultivated, this, which comprehends the principles of all of them, should be still suffered to remain in its infancy.

I shall endeavor to illustrate a few of these advantages, beginning with what appears to me to be the most important of

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may extend our conquests over all those sciences which more intimately concern human life, and may afterward proceed at leisure to discover more fully those which are the objects of pure curiosity. There is no question of importance whose decision is not comprised in the science of man; and there is none which can be decided with any certainty, before we become acquainted with that science."]

any; *the light which a philosophical analysis of the principles of the mind would necessarily throw on the subjects of intellectual and moral education.*

The nature and purposes of education. — The most essential objects of education are the two following: *First,* to cultivate all the various principles of our nature, both speculative and active,* in such a manner as to bring them to the greatest perfection of which they are susceptible; and, *secondly,* by watching over the impressions and associations which the mind receives in early life, to secure it against the influence of prevailing errors; and, as far as possible, to engage its prepossessions on the side of truth. It is only upon a philosophical analysis of the mind, that a systematical plan can be founded for the accomplishment of either of these purposes.

There are few individuals whose education has been conducted in every respect with attention and judgment. Almost every man of reflection is conscious, when he arrives at maturity, of many defects in his mental powers, and of many inconvenient habits, which might have been prevented or remedied in his infancy or youth. Such a consciousness is the first step towards improvement; and the person who feels it, if he is possessed of resolution and steadiness, will not scruple to begin, even in advanced years, a new course of education for himself. The degree of reflection and observation, indeed, which is necessary for this purpose, cannot be expected from any one at a very early period of life, as these are the last powers of the mind which unfold themselves; but it is never too late to think of the improvement of our faculties; and much progress may be made in the art of applying them successfully to their proper objects, or in obviating the inconveniences resulting from their imperfection, not only in manhood, but in old age.

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* [By the *speculative principles* of our nature, Stewart here means the various powers or faculties of the *intellect* or the *understanding,* in the narrowest sense of these terms; such as the faculties of *perception, memory, judgment, imagination,* etc. All these powers we might conceive to be in full employment, though man should lead a life of mere contemplation or reverie, never putting forth any voluntary exertion whatsoever, either of mind or body. What Stewart calls the *active principles* of human nature might be more properly termed *principles of action,* or rather *impulses to action,* — such as the *appetites, desires, affections, self-love,* and *conscience.* These stimulate us to exertion; these point out *ends* to be pursued, while the intellect furnishes, as it were, the *means* for their attainment.

> "Reason the card, but passion is the gale."

Stewart's phraseology here is faulty, for the intellectual powers, such as memory and imagination, may be just as *active* (that is, in as full exercise,) as the appetites or the conscience; but the former do not stimulate man to voluntary exertion, unless they are conjoined with some desire.]

Injurious effects of exclusive addiction to one employment or pursuit.—It is not, however, to the mistakes of our early instructors, that all our intellectual defects are to be ascribed. There is no profession or pursuit which has not habits peculiar to itself, and which does not leave some powers of the mind dormant, while it exercises and improves the rest. If we wish, therefore, to cultivate the mind to the extent of its capacity, we must not rest satisfied with that employment which its faculties receive from our particular situation in life. It is not in the awkward and professional form of a mechanic, who has strengthened particular muscles of his body by the habits of his trade, that we are to look for the perfection of our animal nature; neither is it among men of confined pursuits, whether speculative or active, that we are to expect to find the human mind in its highest state of cultivation. A variety of exercises is necessary to preserve the animal frame in vigor and beauty; and a variety of those occupations which literature and science afford, added to a promiscuous intercourse with the world, in the habits of conversation and business, is no less necessary for the improvement of the understanding. I acknowledge, that there are some professions in which a man of very confined acquisitions may arrive at the first eminence, and in which he will perhaps be the more likely to excel, the more he has concentrated the whole force of his mind to one particular object. But such a person, however distinguished in his own sphere, is educated merely to be a literary artisan, and neither attains the perfection nor the happiness of his nature. "That education only can be considered as complete and generous, which" (in the language of Milton) "fits a man to perform justly, skilfully, and magnanimously, all the offices, both private and public, of peace and of war."

I hope it will not be supposed, from the foregoing observations, that they are meant to recommend an indiscriminate attention to all the objects of speculation and of action. Nothing can be more evident, than the necessity of limiting the field of our exertion, if we wish to benefit society by our labors. But it is perfectly consistent with the most intense application to our favorite pursuit, to cultivate that general acquaintance with letters and with the world which may be sufficient to enlarge the mind, and to preserve it from any danger of contracting the pedantry of a particular profession. In many cases, (as was already remarked,) the sciences reflect light on each other; and the general acquisitions, which we have made in other pursuits, may furnish us with useful helps for the further prosecution of our own. But even in those instances in which the case is otherwise, and in which these liberal accomplishments must be purchased by the sacrifice of a part of our professional eminence, the acquisition of them will amply repay any loss we may sustain. It ought not to be the leading object of any one, to become an eminent metaphysician, mathematician, or poet, but to render himself happy as an individual, and an agreeable, a respectable, and a useful member of society. A man who loses his sight, improves the sensibility of his touch; but who would consent, for such a recompense, to part with the pleasures which he receives from the eye?

Light thrown by the philosophy of mind upon the theory and practice of education. — It is almost unnecessary for me to remark, how much individuals would be assisted in the proper and liberal culture of the mind, if they were previously led to take a comprehensive survey of human nature in all its parts; of its various faculties, and powers, and sources of enjoyment, and of the effects which are produced on these principles by particular situations. It is such a knowledge alone of the capacities of the mind, that can enable a person to judge of his own acquisitions, and to employ the most effectual means for supplying his defects and removing his inconvenient habits. Without some degree of it, every man is in danger of contracting bad habits before he is aware, and of suffering some of his powers to go to decay, for want of proper exercise.

If the business of early education were more thoroughly and more generally understood, it would be less necessary for individuals, when they arrive at maturity, to form plans of improvement for themselves. But education never can be systematically directed to its proper objects, till we have obtained, not only an accurate analysis of the general principles of our nature, and an account of the most important laws which regulate their operation; but an explanation of the various modifications and combinations of these principles, which produce that diversity of talents, genius, and character, we observe among men. To instruct youth in the languages and in the sciences is comparatively of little importance, if we are inattentive to the habits they acquire, and are not careful in giving to all their different faculties, and all their different principles of action, a proper degree of employment. Abstracting entirely from the culture of their moral powers, how extensive and difficult is the business of conducting their intellectual improvement! To watch over the associations which they form in their tender years; to give them early habits of mental activity; to rouse their curiosity, and to direct it to proper objects; to exercise their ingenuity and invention; to cultivate in their minds a turn for speculation, and at the same time preserve their attention alive to the objects around them; to awaken their sensibilities to the beauties of nature, and to inspire them with a relish for intellectual enjoyment; — these form but a part of the business of education, and yet the execution even of this part requires an acquaintance with the general principles of our nature, which seldom falls to the share of those to whom the instruction of youth is commonly intrusted.

Nor will such a theoretical knowledge of the human mind as I have now described, be always sufficient in practice. An uncommon degree of sagacity is frequently requisite, in order to accommodate general rules to particular tempers and characters. In whatever way we choose to account for it, whether by original organization or by the operation of moral causes in very early infancy, no fact can be more undeniable, than that there are important differences discernible in the minds of children, previous to that period at which, in general, their intellectual education commences. There is, too, a certain hereditary character (whether resulting from physical constitution, or caught from imitation and the influence of situation) which appears remarkably in particular families. One race, for a succession of generations, is distinguished by a genius for the abstract sciences, while it is deficient in vivacity, in imagination, and in taste; another is no less distinguished for wit, and gaiety, and fancy; while it appears incapable of patient attention or of profound research. The system of education which is proper to be adopted in particular cases, ought undoubtedly to have some reference to these circumstances, and to be calculated, as much as possible, to develop and to cherish those intellectual and active principles in which a natural deficiency is most to be apprehended. Montesquieu, and other speculative politicians, have insisted much on the reference which education and laws should have to climate. I shall not take upon me to say how far their conclusions on this subject are just; but I am fully persuaded, that there is a foundation in philosophy and good sense for accommodating, at a very early period of life, the education of individuals to those particular turns of mind to which, from hereditary propensities, or from moral situation, they may be presumed to have a natural tendency.

There are few subjects more hackneyed than that of education; and yet there is none, upon which the opinions of the world are still more divided. Nor is this surprising; for most of those who have speculated concerning it, have confined their attention chiefly to incidental questions about the comparative advantage of public or private instruction, or the utility of particular languages or sciences; without attempting a previous examination of those faculties and principles of the mind, which it is the great object of education to improve. Many excellent detached observations, indeed, both on the intellectual and moral powers, are to be collected from the writings of ancient and modern authors; but I do not know, that, in any language, an attempt has been made to analyze and illustrate the principles of human nature, in order to lay a philosophical foundation for their proper culture.

The usefulness of systematic and thorough education defended. — I have even heard some very ingenious and intelligent men dispute the propriety of so systematical a plan of instruction. The most successful and splendid exertions, both in the sciences and arts, (it has been frequently remarked,) have been made by individuals, in whose minds the seeds of genius were allowed to shoot up wild and free; while, from the most careful and skilful tuition, seldom any thing results above mediocrity. I shall not, at present, enter into any discussions with respect to the certainty of the fact on which this opinion is founded. Supposing the fact to be completely established, it must still be remembered, that originality of genius does not always imply vigor and comprehensiveness and liberality of mind; and that it is desirable only in so far as it is compatible with these more valuable qualities. I have already hinted, that there are some pursuits, in which, as they require the exertion only of a small number of our faculties, an individual, who has a natural turn for them, will be more likely to distinguish himself, by being suffered to follow his original bias, than if his attention were distracted by a more liberal course of study. But wherever such men are to be found, they must be considered, on the most favorable supposition, as having sacrificed, to a certain degree, the perfection and the happiness of their nature, to the amusement or instruction of others. It is, too, in times of general darkness and barbarism, that what is commonly called originality of genius most frequently appears: and surely the great aim of an enlightened and benevolent philosophy is, not to rear a small number of individuals, who may be regarded as prodigies in an ignorant and admiring age, but to diffuse, as widely as possible, that degree of cultivation which may enable the bulk of a people to possess all the intellectual and moral improvement of which their nature is susceptible. "Original genius," (says Voltaire) "occurs but seldom in a nation where the literary taste is formed. The number of cultivated minds which there abound, like the trees in a thick and flourishing forest, prevent any single individual from rearing his head far above the rest. Where trade is in few hands, we meet with a small number of overgrown fortunes in the midst of a general poverty: in proportion as it extends, opulence becomes general, and great fortunes rare. It is precisely because there is, at present, much light and much cultivation in France, that we are led to complain of the want of superior genius."

How far education conduces to happiness.—To what purpose, indeed, it may be said, is all this labor? Is not the importance of every thing to man to be ultimately estimated by its tendency to promote his happiness? And is not our daily experience sufficient to convince us, that this is, in general, by no means proportioned to the culture which his nature has received? Nay, is there not some ground for suspecting, that the lower orders of men enjoy, on the whole, a more enviable condition, than their more enlightened and refined superiors?

The truth, I apprehend, is, that happiness, in so far as it arises from the mind itself, will be always proportioned to the degree of perfection which its powers have attained; but that, in cultivating these powers with a view to this most important of all objects, it is essentially necessary that such a degree of attention be bestowed on all of them, as may preserve them in that state of relative strength, which appears to be agreeable to the intentions of nature. *In consequence of an exclusive attention to the culture of the imagination, the taste, the reasoning faculty, or any of the active principles, it is possible that the pleasures of human life may be diminished, or its pains increased; but the inconveniences which are experienced in such cases are not to be ascribed to education, but to a partial and injudicious education.* In such cases, it is possible that the poet, the metaphysician, or the man of taste and refinement, may appear to disadvantage when compared with the vulgar; for such is the benevolent appointment of Providence with respect to the lower orders, that, although not one principle of their nature be completely unfolded, the whole of these principles preserve among themselves that balance which is favorable to the tranquillity of their minds, and to a prudent and steady conduct in the limited sphere which is assigned to them, far more completely than those of their superiors, whose education has been conducted on an erroneous or imperfect system: but all this, far from weakening the force of the foregoing observations, only serves to demonstrate how impossible it always will be, to form a rational plan for the improvement of the mind without an accurate and comprehensive knowledge of the principles of the human constitution.

That the memory, the imagination, or the reasoning faculty are to be instantly strengthened in consequence of our speculations concerning their nature, it would be absurd to suppose; but it is surely far from being unreasonable to think, that an acquaintance with the laws which regulate these powers may suggest some useful rules for their gradual cultivation, for remedying their defects in the case of individuals, and even for extending those limits which nature seems, at first view, to have assigned them.

To how great a degree of perfection the intellectual and moral nature of man is capable of being raised by cultivation, it is difficult to conceive. The effects of early, continued, and systematical education in the case of those children who are trained, for the sake of gain, to feats of strength and agility, justify, perhaps, the most sanguine views which it is possible for a philosopher to form with respect to the improvement of the species.

The Philosophy of Mind enables us to control early impressions and associations.—I now proceed to consider, how far the philosophy of mind may be useful in accomplishing the second object of education; by assisting us in the management of early impressions and associations.

By far the greater part of the opinions on which we act in life, are not the result of our own investigations; but are adopted implicitly, in infancy and youth, upon the authority of others. Even the great principles of morality, although implanted in every heart, are commonly aided and cherished, at least to a certain degree, by the care of our instructors. All this is undoubtedly agreeable to the intentions of nature; and, indeed, were the case otherwise, society could not subsist; for nothing can be more evident, than that the bulk of mankind, condemned as they are to laborious occupations, which are incompatible with intellectual improvement, are perfectly incapable of forming their opinions on some of the most important subjects that can employ the human mind. It is evident, at the same time, that as no system of education is perfect, a variety of prejudices must, in this way, take an early hold of our belief; so as to acquire over it an influence not inferior to that of the most incontrovertible truths. When a child hears either a speculative absurdity, or an erroneous principle of action, recommended and enforced daily, by the same voice which first conveyed to it those simple and sublime lessons of morality and religion which are congenial to its nature, is it to be wondered at, that, in future life, it should find it so difficult to eradicate prejudices which have twined their roots with all the essential principles of the human frame? — If such, however, be the obvious intentions of nature, with respect to those orders of men who are employed in bodily labor, it is equally clear, that she meant to impose it as a double obligation on those who receive the advantages of a liberal education, to examine, with the most scrupulous care, the foundation of all those received opinions which have any connection with morality, or with human happiness. If the multitude must be led, it is of consequence, surely, that it should be led by enlightened conductors; by men who are able to distinguish truth from error, and to draw the line between those prejudices which are innocent or salutary, (if indeed there are any prejudices which are really salutary,) and those which are hostile to the interests of virtue and of mankind.

Necessity of unlearning early errors. — In such a state of society as that in which we live, the prejudices of a moral, a political, and a religious nature, which we imbibe in early life, are so various, and at the same time so intimately blended with the belief we entertain of the most sacred and important truths, that a great part of the life of a philosopher must necessarily be devoted, not so much to the acquisition of new knowledge, as to unlearn the errors to which he had been taught to give an implicit assent before the dawn of reason and reflection. And unless he submit in this manner to bring all his opinions to the test of a severe examination, his ingenuity and his learning, instead of enlightening the world, will only enable him to give an additional currency, and an additional authority, to established errors. To attempt such a struggle against early prejudices is, indeed, the professed aim of all philosophers; but how few are to be found who have force of mind sufficient for accomplishing their object; and who, in freeing themselves from one set of errors, do not allow themselves to be carried away with another? To succeed in it completely, Lord Bacon seems to have thought, (in one of the most remarkable passages of his writings,) to be more than can well be expected from human frailty.

Philosophy guards us against general skepticism. — Nor is it merely in order to free the mind from the influence of error, that it is useful to examine the foundation of established opinions. It is such an examination alone, that, in an inquisitive age like the present, can secure a philosopher from the danger of unlimited skepticism. To this extreme, indeed, the complexion of the times is more likely to give him a tendency, than to implicit credulity. In the former ages of ignorance and superstition, the intimate association which had been formed, in the prevailing systems of education, between truth and error, had given to the latter an ascendant over the minds of men, which it could never have acquired, if divested of such an alliance. The case has, of late years, been most remarkably reversed; the common sense of mankind, in consequence of the growth of a more liberal spirit of inquiry, has revolted against many of those absurdities, which had so long held human reason in captivity; and it was, perhaps, more than could reasonably have been expected, that, in the first moments of their emancipation, philosophers should have stopped short at the precise boundary, which cooler reflection, and more moderate views, would have prescribed. The fact is, that they have passed far beyond it; and that, in their zeal to destroy prejudices, they have attempted to tear up by the roots many of the best and happiest and most essential principles of our nature. Having remarked the powerful influence of education over the mind, they have concluded, that man is wholly a factitious being; not recollecting, that this very susceptibility of education presupposes certain original principles, which are common to the whole species; and that, as error can only take a permanent hold upon a candid mind by being grafted on truths, which it is unwilling or unable to eradicate, even the influence, which false and absurd opinions occasionally acquire over the belief, instead of being an argument for universal skepticism, is the most decisive argument against it; inasmuch as it shows, that there are some truths so incorporated and identified with our nature, that they can reconcile us even to the absurdities and contradictions with which we suppose them to be inseparably connected. The skeptical philosophers, for example, of the present age, have frequently attempted to hold up to ridicule those contemptible and puerile superstitions, which have disgraced the creeds of some of the most enlightened nations, and which have not only commanded the assent, but the reverence, of men of the most accomplished understandings. But these histories of human imbecility are, in truth, the strongest testimonies which can be produced, to prove how wonderful is the influence of the fundamental principles of morality over the belief; when they are able to sanctify, in the apprehensions of mankind, every extravagant opinion, and every unmeaning ceremony, which early education has taught us to associate with them.

Feeble and unphilosophical minds exposed both to credulity and skepticism.— That implicit credulity is a mark of a feeble mind, will not be disputed; but it may not perhaps be as generally acknowledged, that the case is the same with unlimited skepticism: on the contrary, we are sometimes apt to ascribe this disposition to a more than ordinary vigor of intellect. Such a prejudice was by no means unnatural at that period in the history of modern Europe, when reason first began to throw off the yoke of authority; and when it unquestionably required a superiority of understanding, as well as of intrepidity, for an individual to resist the contagion of prevailing superstition. But in the present age, in which the tendency of fashionable opinions is directly opposite to those of the vulgar, the philosophical creed, or the philosophical skepticism of by far the greater number of those who value themselves on an emancipation from popular errors, arises from the very same weakness with the credulity of the multitude: nor is it going too far to say, with Rousseau, that, "He who, in the end of the eighteenth century, has brought himself to abandon all his early principles without discrimination, would probably have been a bigot in the days of the League." In the midst of these contrary impulses, of fashionable and vulgar prejudices, he alone evinces the superiority and the strength of his mind, who is able to disentangle truth from error; and to oppose the clear conclusions of his own unbiassed faculties, to the united clamors of superstition and of false philosophy. Such are the men, whom nature marks out to be the lights of the world, to fix the wavering opinions of the multitude, and to impress their own characters on that of their age.

For securing the mind completely from the weakness I have now been describing, and enabling it to maintain a steady course of inquiry between implicit credulity and unlimited skepticism, the most important of all qualities is a sincere and devoted attachment to truth; which seldom fails to be accompanied with a manly confidence in the clear conclusions of human reason. It is such a confidence, united (as it generally is) with personal intrepidity, which forms what the French writers call force of character; one of the rarest endowments, it must be confessed, of our species; but which, of all endowments, is the most essential for rendering a philosopher happy in himself, and a blessing to mankind.

Enlightened education in youth the best preservative against skepticism.—From the observations which have been made, it sufficiently appears, that, in order to secure the mind, on the one hand, from the influence of prejudice, and on the other, from a tendency to unlimited skepticism, it is necessary that it should be able to distinguish the original and universal principles and laws of human nature from the adventitious effect of local situation. But if, in the case of an individual who has received an imperfect or erroneous education, such a knowledge puts it in his power to correct, to a certain degree, his own bad habits, and to surmount his own speculative errors, it enables him to be useful, in a much higher degree, to those whose education he has an opportunity of superintending from early infancy. Such, and so permanent, is the effect of first impressions on the character, that, although a philosopher may succeed, by perseverance, in freeing his reason from the prejudices with which it was entangled, they will still retain some hold of his imagination and his affections; and, therefore, however enlightened his understanding may be in his hours of speculation, his philosophical opinions will frequently lose their influence over his mind, in those very situations in which their practical assistance is most required; when his temper is soured by misfortune, or when he engages in the pursuits of life, and exposes himself to the contagion of popular errors. His opinions are supported merely by speculative arguments; and, instead of being connected with any of the active principles of his nature, are counteracted and thwarted by some of the most powerful of them. How different would the case be, if education were conducted from the beginning with attention and judgment! Were the same pains taken to impress truth on the mind in early infancy, that are often taken to inculcate error, the great principles of our conduct would not only be juster than they are, but, in consequence of the aid which they would receive from the imagination and the heart, trained to conspire with them in the same direction, they would render us happier in ourselves, and would influence our practice more powerfully and more habitually. There is surely nothing in error which is more congenial to the mind than truth. On the contrary, when exhibited separately and alone to the understanding, it shocks our reason and provokes our ridicule; and it is only (as I had occasion already to remark) by an alliance with truths which we find it difficult to renounce, that it can obtain our assent or command our reverence. What advantages, then, might be derived from a proper attention to early impressions and associations, in giving support to those principles which are connected with human happiness? The long reign of error in the world, and the influence it maintains, even in an age of liberal inquiry, far from being favorable to the supposition, that human reason is destined to be forever the sport of prejudice and absurdity, demonstrates the tendency which there is to permanence in established opinions and in established institutions, and promises an eternal stability to true philosophy, when it shall once have acquired the ascendant, and when proper means shall be employed to support it by a more perfect system of education.

Our daily experience may convince us, how susceptible the tender mind is of deep impressions, and what important and permanent effects are produced on the characters and the happiness of individuals, by the casual associations formed in childhood among the various ideas, feelings, and affections with which they were habitually occupied. It is the business of education not to counteract this constitution of nature, but to give it a proper direction; and the miserable consequences to which it leads, when under an improper regulation, only show what an important instrument of human improvement it might be rendered in more skilful hands. If it be possible to interest the imagination and the heart in favor of error, it is, at least, no less possible to interest them in favor of truth. If it be possible to extinguish all the most generous and heroic feelings of our nature, by teaching us to connect the idea of them with those of guilt and impiety, it is surely equally possible to cherish and strengthen them, by establishing the natural alliance between our duty and our happiness. If it be possible for the influence of fashion to veil the native deformity of vice, and to give to low and criminal indulgences the appearance of spirit, of elegance, and of gaiety, can we doubt of the possibility of connecting, in the tender mind, these pleasing associations with pursuits that are truly worthy and honorable?

A complicated creed exposes one, by reaction, to general skepticism. — I shall conclude this subject with remarking, that, although in all moral and religious systems there is a great mixture of important truth, and although it is in consequence of this alliance that errors and absurdities are enabled to preserve their hold of the belief, yet it is commonly found, that, in proportion as an established creed is complicated in its dogmas and in its ceremonies, and in proportion to the number of accessory ideas which it has grafted upon the truth, the more difficult is it for those who have adopted it in childhood to emancipate themselves completely from its influence; and in those cases in which they at last succeed, the greater is their danger of abandoning, along with their errors, all the truths which they had been taught to connect with them. The Roman Catholic system is shaken off with much greater difficulty than those which are taught in the Reformed churches; but when it loses its hold on the mind, it much more frequently prepares the way for unlimited skepticism. The cause of this I may, perhaps, have an opportunity of pointing out, in treating of the Association of Ideas.*

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* [Sir William Hamilton places the usefulness of the Philosophy of Mind, considered as a means of education, on different, and, as we think, better chosen, grounds.

"On this ground," he says, "we rest the preëminent utility of metaphysical speculations. That they comprehend all the sublimest objects of our theoretical and moral interest; — that every natural conclusion concerning God, the soul, the present worth, and the future destiny of man, is exclusively metaphysical, will be at once admitted. But we do not found the importance on the paramount dignity of the pursuit. It is as the *best gymnastic of the mind,* — as a *means,* principally and almost exclusively conducive to the highest education of our noblest powers, that we would vindicate to these speculations the necessity which has too frequently been denied them. By no other intellectual application, (and, least of all, by *physical* pursuits,) is the soul thus reflected on itself, and its faculties concentred in such independent, vigorous, unwonted, and continuous energy; — by none, therefore, are its best capacities so variously and intensely evolved. Where there is the most life, there is the victory." — *Discussions on Philosophy, etc.* 2d ed. p. 41.

"Plato has profoundly defined man '*the hunter* of truth;' for in this chase, as in others, the *pursuit* is all in all, the *success* comparatively nothing. We *exist* only as we energize; *pleasure* is the reflex of unimpaired energy; energy is the *mean* by which our faculties are developed; and a higher energy, the *end* which their development proposes. In *action* is thus contained the existence, happiness, improvement, and perfection of our being; and knowledge is only precious, as it may afford a stimulus to the exercise of our powers, and the condition of their more complete activity. *Speculative truth is, therefore, subordinate to speculation itself;* and its value is directly measured by the quantity of energy which it occasions,— immediately in its discovery, mediately through its consequences. Life to Endymion was not preferable to death; aloof from practice, a waking error is better than a sleeping truth.—Neither, in point of fact, is there found any proportion between the *possession* of truths, and the *development* of the mind in which they are deposited. Every *learner* in science is now familiar with more truths than Aristotle or Plato ever dreamt of knowing; yet, compared with the Stagirite or the Athenian, how few, even of our *masters* of modern science, rank higher than intellectual barbarians." —*Ib.* p. 40.

"All profitable study is a silent disputation—an intellectual gymnastic; and the most improving books are precisely those which most excite the reader—to understand the author, to supply what he has omitted, and to canvass his facts and reasonings. To read passively, to learn— is, in reality, not to learn at all. In study, implicit faith, belief upon authority, is worse even than, for a time, erroneous speculation. To read profitably, we should read the authors, not most in unison with, but most adverse to, our opinions; for whatever may be the case in the cure of bodies, *enantiopathy,* and not *homœopathy,* is the true medicine of minds. Accordingly, such sciences and such authors, as present only unquestionable truths, [pure mathematics, for instance, when made a chief object of pursuit,] determining a minimum of self-activity in the student, are, in a rational education, subjectively, naught. Those [such] sciences and authors, on the contrary, as constrain the student to independent thought, [metaphysics, for example,] are, whatever be their objective certainty, *subjectively, educationally,* best."] —*Ib.* p. 773.

PHILOSOPHY

OF

THE HUMAN MIND.

CHAPTER I.

OF THE POWERS OF EXTERNAL PERCEPTION.

I. *Of the theories which have been formed by Philosophers, to explain the manner in which the* MIND *perceives external Objects.*—Among the various phenomena which the human mind presents to our view, there is none more calculated to excite our curiosity and our wonder, than the communication which is carried on between the sentient, thinking, and active principle within us, and the material objects with which we are surrounded. How little soever the bulk of mankind may be disposed to attend to such inquiries, there is scarcely a person to be found, who has not occasionally turned his thoughts to that mysterious influence, which the will possesses over the members of the body; and to those powers of perception which seems to inform us, by a sort of inspiration, of the various changes which take place in the external universe. Of those who receive the advantages of a liberal education, there are perhaps few, who pass the period of childhood, without feeling their curiosity excited by this incomprehensible communication between mind and matter. For my own part, at least, I cannot recollect the date of my earliest speculations on the subject.

Which sense is alone considered in most theories of perception. — In considering the phenomena of perception, it is natural to suppose that the attention of philosophers would be directed, in the first instance, to *the sense of seeing.* The variety of information and of enjoyment we receive by it; the rapidity with which this information and enjoyment are conveyed to us; and above all, the intercourse it enables us to maintain with the more distant part of the universe, cannot fail to give it, even in the apprehension of the most careless observer, a preëminence over all our other perceptive faculties. Hence it is, that the various theories, which have been formed to explain the operations of our senses, have a more immediate reference to that of seeing; and that the greater part of the metaphysical language, concerning perception in general, appears evidently, from its etymology, to have been suggested by the phenomena of vision. Even when applied to this sense, indeed, it can at most amuse the fancy, without conveying any precise knowledge; but when applied to the other senses, it is altogether absurd and unintelligible.

Objections to all the hypotheses that have been framed to explain the process of perception. — It would be tedious and useless, to consider particularly the different hypotheses which have been advanced upon this subject. To all of them, I apprehend, the two following remarks will be found applicable: *First,* that, in the formation of them, their authors have been influenced by some general maxims of philosophizing, borrowed from *physics;* and *secondly,* that they have been influenced by an indistinct, but deep-rooted conviction of the immateriality of the soul; which, although not precise enough to point out to them the absurdity of attempting to illustrate its operations by the analogy of matter, was yet sufficiently strong to induce them to keep the absurdity of their theories as far as possible out of view, by allusions to those physical facts in which the distinctive properties of matter are the least grossly and palpably exposed to our observation. To the former of these circumstances is to be ascribed the general principle, upon which all the known theories of perception proceed; that, in order to explain the intercourse between the mind and distant objects, it is necessary to suppose the existence of something intermediate, by which its perceptions are produced; to the latter, the various metaphorical expressions of *ideas, species, forms, shadows, phantasms, images;* which, while they amused the fancy with some remote analogies to the objects of our senses, did not directly revolt our reason, by presenting to us any of the tangible qualities of body.

The doctrine of mediate perception, or of perception through the intervention of images or ideas.—It was the doctrine of Aristotle, (says Dr. Reid,) that as our senses cannot receive external material objects themselves, they receive their *species;* that is, their *images* or *forms,* without the matter; as wax receives the form of the seal, without any of the matter of it. These images or forms, impressed upon the senses, are called *sensible species;* and are the objects only of the sensitive part of the mind: but by various internal powers, they are retained, refined, and spiritualized, so as to become objects of memory and imagination; and, at last, of pure intellection. When they are objects of memory and of imagination, they get the name of *phantasms.* When, by further refinement, and being stripped of their peculiarities, they become objects of science, they are called *intelligible species;* so that every immediate object, whether of sense, of memory, of imagination, or of reasoning, must be some phantasm, or species, in the mind itself.

The Platonists, too, although they denied the great doctrine of the Peripatetics, that all the objects of human understanding enter at first by the senses; and maintained, that there exist eternal and immutable ideas, which were prior to the objects of sense, and about which all science was employed; yet appear to have agreed with them in their notions concerning the mode in which external objects are perceived. This Dr. Reid infers, partly from the silence of Aristotle about any difference between himself and his master upon this point; and partly from a passage in the seventh book of Plato's Republic, in which he compares the process of the mind in perception to that of a person in a cave, who sees not external objects themselves, but only their shadows.

"Two thousand years after Plato," (continues Dr. Reid,) "Mr. Locke, who studied the operations of the human mind so much, and with so great success, represents our manner of perceiving external objects by a similitude very much resembling that of the cave. 'Methinks,' says he, 'the understanding is not much unlike a closet, wholly shut from light, with only some little opening left, to let in external visible resemblances or ideas of things without. Would the pictures coming into such a dark room but stay there, and lie so orderly as to be found upon occasion, it would very much resemble the understanding of a man, in reference to all objects of sight, and the ideas of them.'

"Plato's subterranean cave, and Mr. Locke's dark closet, may be applied with ease to all the systems of perceptions that have been invented: for *they all suppose, that we perceive not external objects immediately;* and that *the immediate objects of perception are only certain shadows of the external objects.* Those shadows, or images, which we immediately perceive, were by the ancients called *species, forms, phantasms.* Since the time of Des Cartes, they have commonly been called *ideas;* and by Mr. Hume, *impressions.* But all philosophers, from Plato to Mr. Hume, agree in this, that we do not perceive external objects immediately; and that the immediate object of perception must be some image present to the mind." On the whole, Dr. Reid remarks, "that in their sentiments concerning perception, there appears an uniformity which rarely occurs upon subjects of so abstruse a nature."

Objections to this doctrine of mediate perception.—The very short and imperfect view we have now taken of the common theories of perception, is almost sufficient, without any commentary, to establish the truth of the two general observations formerly made; for they all evidently proceed on a supposition, suggested by the phenomena of physics, (1.) that *there must* of necessity *exist some medium of communication between* the objects of *perception and the percipient mind;* and they all indicate a secret conviction in their authors, (2.) of *the essential distinction between mind and matter;* which, although not rendered, by reflection, sufficiently precise and satisfactory to show them the absurdity of attempting to explain the mode of their communication; had yet such a degree of influence on their speculations, as to induce them to *exhibit their supposed medium under as mysterious and ambiguous a form as possible,* in order that it might remain doubtful to which of the two predicaments, of body or mind, they meant that it should be referred. By *refining away the grosser qualities of matter,* and by allusions to some of the most aerial and magical appearances it assumes, they endeavored, as it were, to spiritualize the nature of their medium; while at the same time, all their language concerning it implied such a reference to matter, as was necessary for furnishing a plausible foundation for applying to it the received maxims of natural philosophy.

Another observation, too, which was formerly hinted at, is confirmed by the same historical review; that, in the order of inquiry, the *phenomena of vision had first engaged the attention* of philosophers, and had suggested to them the greater part of their language with respect to *perception in general;* and that, in consequence of this circumstance, the common modes of expression on the subject, unphilosophical and fanciful at best, even when applied to the sense of seeing, are, in the case of all the other senses, obviously unintelligible and self-contradictory. As to objects of *sight,* says Dr. Reid, I understand what is meant by an *image* of their *figure* in the brain; but how shall we conceive an *image* of their *color,* where there is absolute darkness? And, as to all other objects of sense, except figure and color, I am unable to conceive what is meant by an image of them. Let any man say, what he means by an *image of heat and cold,* an image of *hardness* or *softness,* an image of *sound,* or *smell,* or *taste.* The word *image,* when applied to these objects of sense, has absolutely no meaning. This palpable imperfection in the ideal theory has plainly taken rise from the natural order in which the phenomena of perception present themselves to the curiosity.

That in the case of the perception of distant objects, we are naturally inclined to suspect, either *something* to be *emitted from* *the object to the organ of sense*, or *some medium* to intervene *between the object and organ*, by means of which the former may communicate an impulse to the latter, appears from the common modes of expression on the subject, which are to be found in all languages. In our own, for example, we frequently hear the vulgar speak of *light striking the eye;* not in consequence of any philosophical theory they have been taught, but of their own crude and undirected speculations. Perhaps there are few men among those who have attended at all to the history of their own thoughts, who will not recollect the influence of these ideas, at a period of life long prior to the date of their philosophical studies. Nothing, indeed, can be conceived more simple and natural than their origin. When an object is placed in a certain situation with respect to a particular organ of the body, a perception arises in the mind; when the object is removed, the perception ceases. Hence we are led to apprehend *some connection between the object and the perception;* and as we are accustomed to believe, that matter produces its effects by impulse, we conclude that there must be some material medium intervening between the object and organ, by means of which the impulse is communicated from the one to the other. — That this is really the case, I do not mean to dispute. — I think, however, it is evident, that the existence of such a medium does not in any case appear *à priori:* and yet the natural prejudices of men have given rise to an universal belief of it, long before they were able to produce any good arguments in support of their opinion.

Nor is it only to account for the connection between the object and the organ of sense, that philosophers have had recourse to the theory of impulse. They have imagined that *the impression on the organ of sense is communicated to the mind, in a similar manner.* As one body produces a change in the state of another by impulse, so it has been supposed, that the external object produces perception, (which is a change in the state of the mind,) *first*, by some material impression made on the organ of sense; and, *secondly*, by some material impression communicated from the organ to the mind along the nerves and brain.

These suppositions, indeed, as I had occasion already to hint, were, in the ancient theories of perception, rather implied than expressed; but by modern philosophers, they have been stated in the form of explicit propositions. "As to the manner," says Mr. Locke, "in which bodies produce ideas in us, it is manifestly by impulse, the only way which we can conceive *bodies* operate in." Dr. Clark has expressed the same idea still more confidently, in the following passage of one of his letters to Leibnitz. "Without being present to the images of the things perceived, the soul could not possibly perceive them. A living substance can only there perceive, where it is present. Nothing can any more act, or be acted upon, *where* it is not present, than it can *when* it is not." "How body acts upon mind, or mind upon body," (says Dr. Porterfield) "I know not; but this I am very certain of, that nothing can act, or be acted upon, where it is not; and therefore our mind can never perceive any thing but its own proper modifications, and the various states of the sensorium, to which it is present: so that it is not the external sun and moon, which are in the heavens, which our mind perceives, but only their image or representation, impressed upon the sensorium. How the soul of a seeing man sees these images, or how it receives those ideas, from such agitations in the sensorium, I know not; but I am sure it can never perceive the external bodies themselves, to which it is not present."

Theories of perception by Monboddo and Malebranche. — The same train of thinking, which had led these philosophers to suppose that external objects are perceived by means of species proceeding from the object to the mind, or by means of some material impression made on the mind by the brain, has suggested to a late writer a very different theory; that *the mind*, when it perceives an external object, *quits the body*, and is present to the object of perception. "The mind," (says the learned author of Ancient Metaphysics,) "is not where the body is, when it perceives what is distant from the body, either in time or place, because nothing can act, but when, and where, it is. Now, the mind acts when it perceives. The mind, therefore, of every animal who has memory or imagination, acts, and by consequence exists, when and where the body is not; for it perceives objects distant from the body both in time and place." Indeed, if we take for granted, that in perception the mind acts upon the object, or the object upon the mind, and, at the same time, admit the truth of the maxim, that "nothing can act but where it is," we must, of necessity conclude, either that objects are perceived in a way similar to what is supposed in the ideal theory, or that, in every act of perception, the soul quits the body, and is present to the object perceived. And accordingly, this alternative is expressly stated by Malebranche; who differs, however, from the writer last quoted, in the choice which he makes of his hypothesis; and even rests his proof of its truth on the improbability of the other opinion. "I suppose," says he, "that every one will grant, that we perceive not external objects immediately, and of themselves. We see the sun, the stars, and an infinity of objects without us; and it is not at all likely that, upon such occasions, the soul *sallies out of the body* in order to be present to the objects perceived. She sees them not therefore by themselves; and the immediate object of the mind is not the thing perceived, but something which is intimately united to the soul; and it is that which I call an *idea:* so that by the word *idea,* I understand nothing else here but *that which is nearest to the mind when we perceive any object.* It ought to be carefully observed, that, in order to the mind's perceiving any object, it is absolutely necessary that the ideas of that object be actually present to it. Of this it is not possible to doubt. The things which the soul perceives, are of two kinds. They are either in the soul, or they are without the soul. Those that are in the soul, are its own thoughts; that is to say, all its different modifications. The soul has no need of ideas for perceiving these things. But with regard to things without the soul, we cannot perceive them but by means of ideas."

All these theories appear to me to have taken their rise, *first,* from an inattention to the proper object of philosophy, and, *secondly,* from an apprehension, that we understand the connection between impulse and motion better than any other physical fact. From the detail which I have given, it appears how extensive an influence this prejudice has had on the inquiries both of natural philosophers and of metaphysicians.

II. *Of Dr. Reid's Speculations on the subject of Perception.* — It was chiefly in consequence of the skeptical conclusions which Bishop Berkeley and Mr. Hume had deduced from the ancient theories of perception, that Dr. Reid was led to call them in question; and he appears to me to have shown, in the most satisfactory manner, not only that they are perfectly hypothetical, but that the suppositions they involve are absurd and impossible. His reasonings, on this part of our constitution, undoubtedly form the most important accession which the philosophy of the human mind has received since the time of Mr. Locke.

But although Dr. Reid has been at much pains to overturn the old ideal system, *he has not ventured to substitute any hypothesis of his own* in its place. And, indeed, he was too well acquainted with the limits prescribed to our philosophical inquiries, to think of indulging his curiosity in such unprofitable speculations. All, therefore, that he is to be understood as aiming at, in his inquiries, concerning our perceptive powers, is *to give a precise statement of the fact, divested of all theoretical expressions;* in order to prevent philosophers from imposing on themselves any longer, by words without meaning; and to extort from them an acknowledgment, that, with respect to the process of nature in perception, they are no less ignorant than the vulgar.

Useful effect of plain truth in reminding us of our ignorance, and reviving our natural feelings. — According to this view of Dr. Reid's reasonings on the subject of perception, the purpose to which they are subservient may appear to some to be of no very considerable importance; but the truth is, that one of the most valuable effects of genuine philosophy, is to remind us of the limited powers of the human understanding; and to revive those natural feelings of wonder and admiration, at the spectacle of the universe, which are apt to languish, in consequence of long familiarity. The most profound discoveries which are placed within the reach of our researches, lead to a confession of human ignorance; for, while they flatter the pride of man, and increase his power, by enabling him to trace the simple and beautiful laws by which physical events are regulated, they call his attention, at the same time, to those general and ultimate facts which bound the narrow circle of his knowledge; and which, by evincing to him the operation of powers, whose nature must for ever remain unknown, serve to remind him of the insufficiency of his faculty to penetrate the secrets of the universe. Wherever we direct our inquiries; whether to the anatomy and physiology of animals, to the growth of vegetables, to the chemical attractions and repulsions, or to the motions of the heavenly bodies; we perpetually perceive the effects of powers which cannot belong to matter. To a certain length we are able to proceed; but *in every research, we meet with a line which no industry nor ingenuity can pass.* It is a line, too, which is marked with sufficient distinctness; and which no man now thinks of passing, who has just views of the nature and object of philosophy. It forms the separation between that field which falls under the survey of the physical inquirer, and that unknown region of which, though it was necessary that we should be assured of its existence, in order to lay a foundation for the doctrines of natural theology, it hath not pleased the Author of the universe to reveal to us the wonders, in this infant state of our being. It was, in fact, chiefly by tracing out this line, that Lord Bacon did so much service to science.

Beside this effect, which is common to all our philosophical pursuits, of impressing the mind with a sense of that mysterious agency, or efficiency, into which general laws must be resolved; they have a tendency, in many cases, to counteract the influence of habit, in *weakening those emotions of wonder and of curiosity,* which the appearances of nature are so admirably fitted to excite. For this purpose, it is necessary, either to lead the attention to facts which are calculated to strike by their novelty, or to present familiar appearances in a new light: and such are the obvious effects of philosophical inquiries; sometimes extending our views to objects which are removed from vulgar observation; and sometimes correcting our first apprehensions with respect to ordinary events. The communication of motion by impulse, (as I already hinted,) is as unaccountable as any phenomenon we know; and yet, most men are disposed to consider it as a fact which does not result from will, but from necessity. To such men, it may be useful to direct their attention to the universal law of gravitation; which, although not more wonderful in itself than the common effect of impulse, is more fitted, by its novelty, to awaken their attention, and to excite their curiosity.

Contrary effect of erroneous theories.—If such, however, be the effects of our philosophical pursuits when successfully conducted, it must be confessed that the tendency of imperfect or erroneous theories is widely different. By a specious solution of insuperable difficulties, they so dazzle and bewilder the understanding, as, at once, to prevent us from advancing, with steadiness, towards the limit of human knowledge; and from perceiving the existence of a region beyond it, into which philosophy is not permitted to enter. In such cases, it is the business of genuine science to unmask the imposture, and to point out clearly, both to the learned and to the vulgar, what reason can, and what she cannot, accomplish. This, I apprehend, has been done with respect to the history of our perceptions, in the most satisfactory manner, by Dr. Reid. When a person little accustomed to metaphysical speculation is told, that, in the case of volition, there are certain invisible fluids, propagated from the mind to the organ which is moved, and that, in the case of perception, the existence and qualities of the external object are made known to us by means of species, or phantasms, or images, which are present to the mind in the sensorium; he is apt to conclude that the intercourse between mind and matter is much less mysterious than he had supposed; and that, although these expressions may not convey to him any very distinct meaning, their import is perfectly understood by philosophers. It is now, I think, pretty generally acknowledged by physiologists, that the influence of the will over the body, is a mystery which has never yet been unfolded; but singular as it may appear, Dr. Reid was the first person who had courage to lay completely aside all the common hypothetical language concerning perception, and to exhibit the difficulty in all its magnitude, by a plain statement of the fact.

Statement of Dr. Reid's doctrine. — To what then, it may be asked, does this statement amount? Merely to this; that the mind is so formed, that certain *impressions* produced *on our organs of sense* by external objects, are followed by correspondent *sensations;* and that these sensations, (*which have no more resemblance to the qualities of matter, than the words of a language have to the things they denote,*) *are followed by a perception* of the existence and qualities of the bodies by which the impressions are made: that all the steps of this process are equally incomprehensible; and that, for any thing we can prove to the contrary, the connection between the *sensation* and the *perception,* as well as that between the impression and the sensation, may be both arbitrary; that it is therefore by no means impossible, that our sensations may be merely the occasions on which the correspondent perceptions are excited; and that, at any rate, the consideration of these sensations, which are attributes of mind, can throw no light on the manner in which we acquire our knowledge of the existence and qualities of body.* From this view of the subject, it follows, that *it is the external objects themselves*, and not any species or images of these objects, *that*

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* [The distinction between *sensation* and *perception* is the most original and important feature of Dr. Reid's philosophy. The following explanation of it is nearly in his own words, though it is formed by bringing together many sentences from different portions of his Inquiry and his Essays.

The same mode of expression is used to denote *sensation* and *perception;* the things coalesce in our imagination, and are considered as one simple operation, for the ordinary purposes of life do not require them to be distinguished. But the philosopher needs to distinguish them, and is able to analyze the operation compounded of them. Thus, — *I feel a pain; I see a tree.* The first of these propositions denotes a *sensation,* the last a *perception.*

Sensation has no object distinct from itself. When I am pained, I cannot say that *the pain* I feel is one thing, and *my feeling it* is another thing. They are one and the same thing, and cannot be disjoined even in imagination. The *sensation,* moreover, can have no existence but in a sentient mind; pain, when it is not felt, has no existence.

Perception, on the other hand, *always has an object distinct from itself.*

Thus, *I perceive a tree;* there is here an object which is perceived, and an act of the mind by which it is perceived; and the two are not only distinguishable, but are extremely unlike in their natures. And the tree exists, whether it is perceived or not. The tree, also, which is the object perceived, is made up of a trunk, branches, and leaves; the act of the mind by which it is perceived has neither trunk, branches, nor leaves.

Every *perception* is accompanied by a *sensation*, without which it could not exist. But every *sensation* has not a *perception* as its necessary concomitant; it may exist alone. When I smell a rose, there is in this operation both sensation and perception. The agreeable odor I feel, considered by itself, without relation to any external object, is merely a sensation. This sensation may be felt, when no rose is perceived; as when I enter a room strongly impregnated with otto of rose, though the flower — the rose itself — is not there. This sensation can be nothing else than it is felt to be; its very essence consists in being felt, and when it is not felt, it is not.

Now let us attend to the *perception* which we have in smelling a rose. Perception always has an external object; and the object of my perception, in this case, is that quality in the rose which I discern by or through the sense of smell. This quality in the rose, which produces an effect on my olfactory nerves, is the object of perception; and the act by which I recognize it, and believe it to exist, is perception.

Sir W. Hamilton even lays it down as a general rule, that, *above a certain point, the stronger the Sensation, the weaker the Perception; and the distincter the Perception, the less obtrusive the Sensation.* In other words, *Perception and Sensation are always found in an inverse ratio to each other.* Thus, if I strike my hand *lightly* against the corner of the table, the sensation which is produced is slight, and I have a very distinct perception of the hardness and angularity of the table which produce the sensation. But if I strike my hand *violently* against it, the sensation produced is acute and painful, and, my attention being absorbed by it, I hardly perceive the shape of the object which has done me the injury. So, again, if I look at the unclouded sun at mid-day, the sensation produced is so vivid and overpowering, that I have hardly any perception either of its form or color. But if I look at the same object towards evening, when it is partially obscured by clouds, the sensation is light and agreeable, and I have a very distinct perception of the sun's circular form and red or golden color.

But observe, the sensation which is felt, and the quality which is perceived, are both called by the same name. In the instance first given, *the smell of a rose* is the name given to both. Hence has arisen the curious question, whether the smell be in the rose, or in the mind that feels *the mind perceives:* and that, although by the constitution of our nature, certain sensations are rendered the constant antecedents of our perceptions, yet it is just as difficult to explain *how* our perceptions are obtained by their means, as it would be upon the supposition that the mind were all at once inspired with them, without any concomitant sensations whatever.*

These remarks are general, and apply to all our various perceptions; and they evidently strike at the root of all the common theories upon the subject. The laws, however, which reg-

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it. The answer is, that there are two different things signified by *the smell of a rose;* one, the sensation, is in the mind, and cannot exist out of the mind; the other, the quality perceived, is in the rose. These two things are called by the same name, not on account of their similitude, for they do not at all resemble each other, but on account of their constant concomitancy. They always go together. All the names we have for *smells, tastes, sounds,* and for the various degrees of *heat* and *cold,* have a like ambiguity; they signify both a sensation, and a quality perceived by means of that sensation. The first is the sign, the last the thing signified.

We say that we *feel* the toothache, not that we perceive it. On the other hand, we say that we *perceive* the color of a body, not that we feel it. Is there any reason for this difference of phraseology? I apprehend that, in both cases, sensation and perception are conjoined. But in the toothache, the sensation, being very painful, engrosses the attention; so that we speak of it as if it were felt only, and not perceived. But in seeing a colored body, the sensation is indifferent, and draws no attention. The quality in the body, which we call its color, is the only object of attention; and therefore we speak of it as if it were perceived, and not felt.]

* This language has been objected to, as bordering on mysticism, whereas, in truth, it is merely a statement of *a fact,* accompanied with an acknowledgment of our total ignorance of the manner in which it is to be explained. Is it any thing more than an extension to the phenomena of perception of what Mr. Hume has so justly and so profoundly remarked concerning the phenomena of voluntary motion? "*Is there any principle in all nature more mysterious than the union of soul and body, by which a supposed spiritual substance acquires such an influence over a material one, that the most refined thought is able to actuate the grossest matter? Were we empowered, by a secret wish, to remove mountains, or control the planets in their orbits, this extensive authority would not be more extraordinary, nor more beyond our comprehension.*" I do not know that Mr. Hume was ever charged with any tendency to mysticism; and yet the two cases seem to me to be perfectly analogous.

ulate these perceptions, are different in the case of the different senses, and form a very curious object of philosophical inquiry. Those, in particular, which regulate the acquired perceptions of sight, lead to some very interesting and important speculations; and, I think, have never yet been explained in a manner completely satisfactory.

III. *Of the Origin of our Knowledge.*—The philosophers who endeavored to explain the operations of the human mind by the theory of ideas, and who took for granted, that, in every exertion of thought, there exists in the mind some object distinct from the thinking substance, were naturally led to inquire whence these ideas derive their origin; in particular, whether they are conveyed to the mind from without by means of the senses, or form part of its original furniture?

With respect to this question, the opinions of the ancients were various; but as the influence of these opinions on the prevailing systems of the present age is not very considerable, it is not necessary, for any of the purposes I have in view in this work, to consider them particularly. The moderns, too, have been much divided on the subject; some holding with Des Cartes, that the mind is furnished with certain *innate ideas;* others, with Mr. Locke, that all our ideas may be traced from *sensation and reflection;* and many, (especially among the later metaphysicians in France,) that they may be all traced from sensation alone.

Of these theories, that of Mr. Locke deserves more particularly our attention; as it has served as a basis of most of the metaphysical systems which have appeared since his time; and as the difference between it and the theory which derives all our ideas from sensation alone, is rather apparent than real.

The theory of Locke.—In order to convey a just notion of Mr. Locke's doctrine concerning the origin of our ideas, it is necessary to remark, that he refers to *sensation* all the ideas which we are supposed to receive by the external senses; our ideas, for example, of colors, of sounds, of hardness, of extension, of motion; and, in short, of all the qualities and modes of matter: to *reflection*, the ideas of our own mental operations which we derive from consciousness; our ideas, for example, of memory, of imagination, of volition, of pleasure, and of pain. These two sources, according to him, furnish us with all our simple ideas, and the only power which the mind possesses over them, is to perform certain operations, in the way of composition, abstraction, generalization, etc., on the materials which it thus collects in the course of its experience. The laudable desire of Mr. Locke to introduce precision and perspicuity into metaphysical speculations, and his anxiety to guard the mind against error in general, naturally prepossessed him in favor of a doctrine, which, when compared with those of his predecessors, was intelligible and simple; and which, by suggesting a method, apparently easy and palpable, of analyzing our knowledge into its elementary principles, seemed to furnish an antidote against those prejudices which had been favored by the hypothesis of innate ideas.

Refutation of it by Dr. Reid. — If Dr. Reid's reasonings on the subject of ideas be admitted, all these speculations with respect to their origin fall to the ground; and the question to which they relate is reduced merely to a question of fact; concerning *the occasions* on which the mind is first led to form those simple notions into which our thoughts may be analyzed, and which may be considered as the principles or elements of human knowledge. With respect to many of these notions, this inquiry involves no difficulty. No one, for example, can be at a loss to ascertain the occasions on which the notions of *colors* and *sounds* are first formed by the mind: for these notions are confined to individuals who are possessed of *particular senses*, and cannot, by any combination of words, be conveyed to those who never enjoyed the use of them. The history of our notions of *extension* and *figure*, (which may be suggested to the mind by the exercise either of sight or of touch,) is not altogether so obvious; and accordingly it has been the subject of various controversies. To trace the origin of these, and of our other simple notions with respect to the qualities of matter; or, in other words, to describe *the occasions on which*, by the laws of our nature, *they are suggested to the mind*, is one of the leading objects of Dr. Reid's inquiry, in his analysis of our external senses; in which he carefully avoids every hypothesis with respect to the inexplicable phenomena of perception and of thought, and confines himself scrupulously to a literal statement of facts. Similar inquiries to these may be proposed, concerning the occasions on which we form the notions of *time*, of *motion*, of *number*, of *causation*, and an infinite variety of others. Thus, it has been observed by different authors, that every perception of change suggests to the mind the notion of a *cause*, without which that change could not have happened. Dr. Reid remarks, that, without the faculty of memory, our perceptive powers could never have led us to form the idea of *motion*. I shall afterwards show, in the sequel of this work, that without the same faculty of memory, we never could have formed the notion of *time;* and that without the faculty of abstraction, we could not have formed the notion of *number*. Such inquiries with respect to the origin of our knowledge, are curious and important; and if conducted with judgment, they may lead to the most certain conclusions; as they aim at nothing more than to ascertain facts, which, although not obvious to superficial observers, may yet be discovered by patient investigation.

Whether all knowledge is derived ultimately from our sensations.—With respect to the general question, Whether all our knowledge may be ultimately traced from our sensations? I shall only observe at present, that the opinion we form concerning it is of much less consequence than is commonly supposed. That the mind cannot, without the grossest absurdity, be considered in the light of a receptacle, which is gradually furnished from without by materials introduced by the channel of the senses; nor in that of a *tabula rasa*, upon which copies or resemblances of things external are imprinted; I have already shown at sufficient length. Although, therefore, we should acquiesce in the conclusion, that, without our organs of sense, the mind must have remained destitute of knowledge, this concession could have no tendency whatever to favor the principles of materialism; as it implies nothing more than that *the im-*

pressions made on our senses by external objects *furnish the occasions on which the mind*, by the laws of its constitution, *is led to perceive the qualities of the material world*, and to exert all the different modifications of thought of which it is capable.

From the very slight view of the subject, however, which has been already given, it is sufficiently evident, that this doctrine, which refers the origin of all our knowledge to the occasions furnished by sense, must be received with many limitations. That those ideas, which Mr. Locke calls *ideas of reflection*, (or in other words, the notions which we form of the subjects of our own consciousness,) are not suggested to the mind immediately by the sensations arising from the use of our organs of perception, is granted on all hands; and, therefore, the amount of the doctrine now mentioned is nothing more than this; that the first occasions on which our various intellectual faculties are exercised, are furnished by the impressions made on our organs of sense; and consequently, that, without these impressions, it would have been impossible for us to arrive at the knowledge of our faculties. Agreeably to this explanation of the doctrine, it may undoubtedly be said with plausibility, (and I am inclined to believe, with truth,) that *the occasions on which all our notions are formed, are furnished either immediately or ultimately by sense;* but if I am not much mistaken, this is not the meaning which is commonly annexed to the doctrine, either by its advocates or their opponents.* One thing at least is obvious, that, in this sense, it does not lead to those consequences which have interested one party of philosophers in its defence, and another in its refutation.

The faculties of the mind may come into operation before we know of the existence of the material world. — There is another very important consideration which deserves our attention in this argument: that, even on the supposition that certain impressions on our organs of sense are necessary to awaken the mind to a consciousness of its own existence, and to give rise to the exercise of its various faculties; yet *all this might have happened without our having any knowledge of the qualities, or even of the existence, of the material world.* To facilitate the admission of this proposition, let us suppose a being formed in every other respect like man; but possessed of no senses, excepting those of *hearing* and *smelling.* I make choice of these two senses, because it is obvious, that, by means of them alone, we never could have arrived at the knowledge of the primary qualities of matter, or even of the existence of things external. All that we could possibly have inferred from our occasional sensations of smell and sound, would have been that there existed some unknown cause by which they were produced.

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* ["All knowledge *begins with* experience," says Kant, "but all knowledge is not *derived from* experience." I may always wake up when the clock strikes *five;* but it is not necessarily the striking of the clock which wakes me up.]

Let us suppose, then, a particular sensation to be excited in the mind of such a being. The moment this happens, he must necessarily acquire the knowledge of two facts at once: that of the existence of *the sensation;* and that of *his own existence,* as a sentient being. After the sensation is at an end, he can *remember* he felt it; he can *conceive* that he feels it again. If he has felt a variety of different sensations, he can compare them together in respect of the *pleasure* or the *pain* they have afforded him; and will naturally *desire* the return of the agreeable sensations, and be *afraid* of the return of those which were painful. If the sensations of smell and sound are both excited in his mind at the same time, he can *attend* to either of them he chooses, and withdraw his attention from the other; or he can withdraw his *attention* from both, and fix it on some sensation he has felt formerly. In this manner, he might be led, merely by sensations existing in his mind, and conveying to him no information concerning matter, to exercise many of his most important faculties; and amidst all these different modifications and operations of his mind, he would feel, with irresistible conviction, that they all belong to one and the same sentient and intelligent being; or, in other words, that they are all modifications and operations of himself. I say nothing, at present, of the various simple notions, (or simple ideas, as they are commonly called,) which would arise in his mind; for example, the ideas of *number*, of *duration*, of *cause* and *effect*, of *personal identity;* all of which, though perfectly unlike his sensations, could not fail to be suggested by means of them. Such a being, then, might know all that we know of mind at present; and *as his language would be appropriated to mind solely, and not borrowed by analogy from material phenomena*, he would even possess important advantages over us in conducting the study of pneumatology.

From these observations it sufficiently appears, what is the real amount of the celebrated doctrine, which refers the origin of all our knowledge to our sensations; and that, even granting it to be true, (which, for my own part, I am disposed to do, in the sense in which I have now explained it,) it would by no means follow from it, that our notions of the operations of mind, nor even many of those notions which are commonly suggested to us, *in the first instance*, by the perception of external objects, are *necessarily subsequent* to our knowledge of the qualities, or even of the existence, of matter.

CHAPTER II.

OF ATTENTION.

Attention necessary to memory, if not to perception. — When we are deeply engaged in conversation, or occupied with any speculation that is interesting to the mind, the surrounding objects *either do not produce in us the perceptions* they are fitted to excite; *or these perceptions are instantly forgotten.* A clock, for example, may strike in the same room with us, without our being able, next moment, to recollect whether we heard it or not.

In these, and similar cases, I believe, it is commonly taken for granted, that we really do not perceive the external object. From some analogous facts, however, I am inclined to suspect that this opinion is not well founded. A person who falls asleep at church, and is suddenly awaked, is unable to recollect the last words spoken by the preacher; or even to recollect that he was speaking at all. And yet, that sleep does not suspend entirely the powers of perception may be inferred from this, that if the preacher were to make a sudden pause in his discourse, every person in the congregation who was asleep would instantly awake. In this case, therefore, it appears, that *a person may be conscious of a perception, without being able afterwards to recollect it.*

Other instances illustrating this fact.—Many other instances of the same general fact might be produced. When we read a book, (especially in a language which is not perfectly familiar to us,) we must perceive successively every different letter, and must afterwards combine these letters into syllables and words, before we comprehend the meaning of a sentence. This process, however, passes through the mind, without leaving any trace in the memory.

It has been proved by optical writers, that, *in perceiving the distances of visible objects from the eye, there is a judgment of the understanding antecedent to the perception.** In some cases, this

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* ["It is, I think, agreed by all," says Berkeley, "that *distance* of itself, and immediately, cannot be seen. For distance being a line directed endwise to the eye, it projects only one point in the fund of the eye; which point remains invariably the same, whether the distance be longer or shorter." Take the following example. If a traveller on a dark night and a strange road sees before him a fixed light which is a mere bright point, he cannot tell whether it is a rod or a mile distant from him; he may even confound it with a star near the horizon. If the light, however, has a visible magnitude, and especially if he can see it flicker, so that he can form some guess as to its origin and nature, he may estimate its distance very correctly. But even in this case, he does not *see* its distance, but *infers* it from the magnitude, color, flickering, or some other circumstance which previous experience has taught him the meaning of.

Many other facts show the necessity of experience before we can obtain correct notions of distance from the eye alone. We are not so much accusjudgment is founded on a variety of circumstances combined together; the conformation of the organ necessary for distinct vision; the inclination of the optic axes; the distinctness or indistinctness of the minute parts of the object; the distances of the intervening objects from each other, and from the eye; and, perhaps, on other circumstances besides these: and yet, in consequence of our familiarity with such processes from our earliest infancy, the perception seems to be instantaneous; and it requires much reasoning, to convince persons unaccustomed to philosophical speculations, that the fact is otherwise.

Another instance, of a still more familiar nature, may be of use, for the further illustration of the same subject. It is well known that *our thoughts do not succeed each other at random, but according to certain laws of association*, which modern philosophers have been at much pains to investigate. It frequently, however, happens, particularly when the mind is animated by conversation, that it makes a sudden transition from one subject to another, which, at first view, appears to be very remote from it; and that *it requires a considerable degree of reflection, to enable a person himself* by whom the transition was made, *to ascertain what were the intermediate ideas.* A curious instance of such a sudden transition is mentioned by Hobbes in his Leviathan. "In a company," (says he,) "in which the conversation turned on the civil war, what could be conceived more impertinent, than for a person to ask abruptly, What was the value of a Roman denarius? On a little reflection, however, I was easily able to trace the train of thought which suggested the question:

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tomed to see objects at a distance from us in a *vertical* line, as in a *horizontal* one; hence, the same visible appearance, if placed directly above or below our own position, does not suggest the same magnitude, as when seen *at an equal distance* on a level with the eye. If we are standing on the seashore, a ship distant a few hundred feet appears of the natural size, and men, not pigmies, walk her deck. But ascend to the brow of the cliff, and

> "The fishermen, that walk upon the beach,
> Appear like mice; and yon tall anchoring bark
> Diminished to her cock; her cock, a buoy
> Almost too small for sight."]

for the original subject of discourse naturally introduced the history of the king, and of the treachery of those who surrendered his person to his enemies; this again introduced the treachery of Judas Iscariot, and the sum of money which he received for his reward. And all this train of ideas," says Hobbes, "passed through the mind of the speaker in a twinkling, in consequence of the velocity of thought." It is by no means improbable, that if the speaker himself had been interrogated about the connection of ideas, which led him aside from the original topic of discourse, he would have found himself, at first, at a loss for an answer.

In the instances which have been last mentioned, we have also a proof, that *a perception or an idea*, which passes through the mind *without leaving any trace in the memory*, *may yet serve to introduce other ideas* connected with it by the laws of association. Other proofs of this important fact shall be mentioned afterwards.

When a perception or an idea passes through the mind, without our being able to recollect it the next moment, the vulgar themselves ascribe our want of memory to a want of attention. Thus, in the instance already mentioned, of the clock, a person, upon observing that the minute-hand had just passed twelve, would naturally say, that he did not attend to the clock when it was striking. There seems, therefore, to be a certain effort of mind upon which, even in the judgment of the vulgar, memory in some measure depends; and which they distinguish by the name of *attention*.

The connection between attention and memory has been remarked by many authors. "Nec dubium est," (says Quinctilian, speaking of memory,) "quin plurimum in hac parte valeat mentis intentio, et velut acies luminum a prospectu rerum quas intuetur non aversa." ["There is no doubt that great effect is produced by close attention, just as vision is most perfect when the eyes are steadily fixed on the object seen."] The same observation has been made by Locke, and by most of the writers on the subject of education.

Attention a separate faculty of the mind. — But although the connection between attention and memory has been frequently remarked in general terms, I do not recollect that the power of attention has been mentioned by any of the writers on pneumatology, in their enumeration of the faculties of the mind;* nor has it been considered by any one, so far as I know, as of sufficient importance to deserve a particular examination. Helvetius, indeed, in his very ingenious work, *De l'Esprit*, has entitled one of his chapters, *De l'inégale capacité d'Attention;* but what he considers under this article, is chiefly that capacity of patient inquiry, (or as he calls it, *continuous attention*,) upon which philosophical genius seems in a great measure to depend. He has also remarked, with the writers already mentioned, that the impression which any thing makes on the memory, depends much on the degree of attention we give to it; but he has taken no notice of that effort which is absolutely essential to the lowest degree of memory. It is this effort that I propose to consider at present: not those different degrees of attention which imprint things more or less deeply on the mind, but that act or effort without which we have no recollection or memory whatever.

Some attention necessary for any act of memory whatever.— With respect to the nature of this effort, it is perhaps impossible for us to obtain much satisfaction. We often speak of greater and less degrees of attention; and, I believe, in these cases, conceive the mind (if I may use the expression) to exert itself with different degrees of energy. I am doubtful, however, if this expression conveys any distinct meaning. For my own part, I am inclined to suppose, (though I would by no means be understood to speak with confidence,) that *it is essential to memory, that the perception or the idea that we would wish to remember, should remain in the mind for a certain space of time, and should*

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* Some important observations on the subject of attention occur in different parts of Dr. Reid's writings. To this ingenious author we are indebted for the remark, that attention to things external is properly called *observation;* and attention to the subjects of our consciousness, *reflection.* He has also explained the causes of the peculiar difficulties which accompany this last exertion of the mind, and which form the chief obstacles to the progress of pneumatology.

be contemplated by it exclusively of every thing else; and that attention consists partly (perhaps entirely) in the effort of the mind to detain the idea or the perception, and to exclude the other objects that solicit its notice.

Notwithstanding, however, the difficulty of ascertaining in what this act of the mind consists, every person must be satisfied of its reality from his own consciousness; and of its essential connection with the power of memory. I have already mentioned several instances of ideas passing through the mind, without our being able to recollect them next moment. These instances were produced, merely to illustrate the meaning I annex to the word *attention;* and to recall to the recollection of the reader, a few striking cases, in which the possibility of our carrying on a process of thought which we are unable to attend to at the time, or to remember afterwards, is acknowledged in the received systems of philosophy. I shall now mention some other phenomena, which appear to me to be very similar to these, and to be explicable in the same manner; although they have commonly been referred to very different principles.

The facility of action which results from habit, explained.— The wonderful effect of practice in the formation of habits, has been often and justly taken notice of, as one of the most curious circumstances in the human constitution. A mechanical operation, for example, which we at first performed with the utmost difficulty, comes, in time, to be so familiar to us, that we are able to perform it without the smallest danger of mistake; even while the attention appears to be completely engaged with other subjects. The truth seems to be, that in consequence of the association of ideas, the different steps of the process present themselves successively to the thoughts without any [effort of] recollection on our part, and with a degree of rapidity proportioned to the length of our experience, so as to save us entirely the trouble of hesitation and reflection, by giving us every moment a precise and steady notion of the effect to be produced.*

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* I do not mean by this observation, to call in question the effects which the practice of the mechanical arts has on the muscles of the body. These

In the case of some operations which are very familiar to us, we find ourselves unable to attend to, or to recollect, the acts of the will by which they are preceded; and accordingly, some philosophers of great eminence have called in question the existence of such volitions; and have represented our habitual actions as involuntary and mechanical. But surely the circumstance of our inability to recollect our volitions, does not authorize us to dispute their possibility; any more than our inability to attend to the process of the mind, in estimating the distance of an object from the eye, authorizes us to affirm that the perception is instantaneous. Nor does it add any force to the objection to urge, that there are instances in which we find it difficult, or perhaps impossible, to check our habitual actions by a contrary volition. For it must be remembered, that this contrary volition does not remain with us steadily during the whole operation; but is merely a general intention or resolution, which is banished from the mind, as soon as the occasion presents itself with which the habitual train of our thoughts and volitions is associated.*

It may indeed be said, that these observations only prove the possibility that our habitual actions *may be* voluntary. But if this be admitted, nothing more can well be required; for surely,

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are as indisputable as its effects on the mind. A man who has been accustomed to write with his right hand, can write better with his left hand, than another who never practised the art at all; but he cannot write so well with his left hand as with his right. The effects of practice, therefore, it should seem, are produced partly on the mind, and partly on the body.

* The solution of this difficulty, which is given by Dr. Porterfield, is somewhat curious. "Such is the power of custom and habit, that many actions which are no doubt voluntary, and proceed from our mind, are in certain circumstances rendered necessary, so as to appear altogether mechanical, and independent of our wills; but it does not from thence follow, that our mind is not concerned in such motions, but only that it has imposed upon itself a law, whereby it regulates and governs them to the greatest advantage. In all this, there is nothing of intrinsical necessity; the mind is at absolute liberty to act as it pleases; but being a wise agent, it cannot choose but to act in conformity to this law, by reason of the utility and advantage that arises from this way of acting."

if these phenomena are clearly explicable from the known and acknowledged laws of the human mind, it would be unphilosophical to devise a new principle, on purpose to account for them. The doctrine, therefore, which I have laid down with respect to the nature of habits, is by no means founded on hypothesis, as has been objected to me by some of my friends; but on the contrary, the charge of hypothesis falls on those who attempt to explain them by saying that they are *mechanical* or *automatic;* a doctrine which, if it is at all intelligible, must be understood as implying the existence of some law of our constitution, which has been hitherto unobserved by philosophers; and to which, I believe, it will be difficult to find any thing analogous in our constitution.

Reid and Hartley on habits in which both body and mind are concerned. — In the foregoing observations, I have had in view a favorite doctrine of Dr. Hartley's, which has been maintained also of late by a much higher authority, I mean Dr. Reid.

"Habit," (says this ingenious author,) "differs from instinct, not in its nature, but in its origin; the last being natural, the first acquired. Both operate without will or intention, without thought, and therefore may be called mechanical principles." In another passage, he expresses himself thus: "I conceive it to be a part of our constitution, that what we have been accustomed to do, we acquire not only a facility, but a proneness, to do on like occasions; so that it requires a particular will or effort to forbear it; but to do it requires, very often, no will at all."

The same doctrine is laid down still more explicitly by Dr. Hartley.

"Suppose," says he, "a person who has a perfectly voluntary command over his fingers, to begin to learn to play on the harpsichord. The first step is to move his fingers from key to key, with a slow motion, looking at the notes, and exerting an express act of volition in every motion. By degrees, the motions cling to one another and to the impressions of the notes, in the way of association so often mentioned, the acts of volition growing less and less express all the time, till at last they become evanescent and imperceptible. For an expert performer will play from notes, or ideas laid up in the memory, and at the same time carry on quite a different train of thoughts in his mind; or even hold a conversation with another. Whence we may conclude, that there is no intervention of the idea, or state of mind, called the will." Cases of this sort, Hartley calls, "transitions of voluntary actions into automatic ones."

Confutation of Hartley's doctrine.—I cannot help thinking it more philosophical to suppose, that those actions which are originally voluntary, always continue so; although, in the case of operations which are become habitual in consequence of long practice, we may not be able *to recollect* every different volition. Thus, in the case of a performer on the harpsichord, I apprehend, that there is an act of the will preceding every motion of every finger, although he may not be able to recollect these volitions afterwards; and although he may, during the time of his performance, be employed in carrying on a separate train of thought. For, it must be remarked that the most rapid performer can, when he pleases, play so slowly, as to be able to attend to, and to recollect, every separate act of his will in the various movements of his fingers; and he can gradually accelerate the rate of his execution, till he is unable to recollect these acts. Now in this instance, one of two suppositions must be made; the one is, that the operations in the two cases are carried on precisely in the same manner, and differ only in the degree of rapidity; and when this rapidity exceeds a certain rate, the acts of the will are too momentary to leave any impression on the memory. The other is, that when the rapidity exceeds a certain rate, the operation is taken entirely out of our hands; and is carried on by some unknown power, of the nature of which we are as ignorant, as of the cause of the circulation of the blood, or of the motion of the intestines.* The last supposition seems to me to be somewhat similar to that of a man, who should maintain, that, although a body projected with a moderate velocity is seen to pass through all the intermediate spaces in moving from one place to another, yet we are not entitled to conclude, that this happens when the body moves so quickly as to become invisible to the eye. The former supposition is supported by the analogy of many other facts in our constitution. Of some of these, I have already taken notice; and it would be easy to add to the number. *An expert accountant*, for example, can sum up, almost with a single glance of his eye, a long column of figures. He can tell the sum with unerring certainty; while, at the same time, he is unable to recollect any one of the figures of which that sum is composed: and yet nobody doubts, that each of these figures has passed through his mind, or supposes, that when the rapidity of the progress becomes so great that he is unable to recollect the various steps of it, he obtains the result by a sort of inspiration. This last supposition would be perfectly analogous to Dr. Hartley's doctrine concerning the nature of our habitual exertions.

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* This seems to have been the opinion of Bishop Berkeley, whose doctrine concerning the nature of our habitual actions, coincides with that of the two philosophers already quoted. "It must be owned, we are not conscious of the systole and diastole of the heart, or the motion of the dia-

Rapidity of the mind's action. — The only plausible objection which, I think, can be offered to the principles I have endeavored to establish on this subject, is founded on the astonishing, and almost incredible, rapidity they necessarily suppose in our intellectual operations. When a person, for example, reads aloud, there must, according to this doctrine, be a separate volition preceding the articulation of every letter; and it has been

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phragm. It may not, nevertheless, be thence inferred, that unknowing nature can act regularly as well as ourselves. The true inference is, that the self thinking individual, or human person, is not the real author of those natural motions. And, in fact, no man blames himself, if they are wrong, or values himself, if they are right. The same may be said of the fingers of a musician, which some object to be moved by habit, which understands not; it being evident that what is done by rule, must proceed from something that understands the rule; therefore, if not from the musician himself, from some other active intelligence; the same, perhaps, which governs bees and spiders, and moves the limbs of those who walk in their sleep."

found, by actual trial,* that it is possible to pronounce about two thousand letters in a minute. Is it reasonable to suppose,

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* "The contractions of the muscles take place and are repeated with incredible quickness. We see this in the running of animals, especially of quadrupeds; and in the movement of the tongue, which articulates in a minute about 400 words, comprising perhaps 2,000 letters; though for the enunciation of many of the letters, several contractions of the muscles are necessary." — Gregory's *View of the Theory of Medicine.*

In Gibbon's Posthumous Works, I find a statement still more curious, as it relates to the number of words pronounced in a given time by a speaker, in the course of an extempore speech. "As I was waiting in the manager's box at Mr. Hastings' trial in Westminster Hall, I had the curiosity to inquire of the shorthand writer, how many words a ready and rapid orator might pronounce in an hour? From 7,000 to 7,500 was the answer. The medium of 7,200 will afford 120 words in each minute."

In this instance, however, here referred to by Gibbon, the business of articulation forms but a very inconsiderable part of the voluntary exertions the speaker is incessantly making. *One* of his efforts, and a very complicated and wonderful one, is taken notice of by Quinctilian in the following passage: "But after all, what is extemporary speaking, but a vigorous exertion of memory [and of attention]? For when we are speaking of one thing, we are premeditating another that we are about to speak. This premeditation is carried forward to other objects, and whatever discoveries it makes, it deposits them in the memory; and thus the invention having placed it there, the memory becomes a kind of intermediate instrument that hands it to the elocution."

A much more comprehensive view, however, of this astonishingly complicated exertion of the mind, is given by Dr. Reid.

"From what cause does it happen, that a good speaker no sooner conceives what he would express, than the letters, syllables, and words arrange themselves according to innumerable rules of speech, while *he* never thinks of these rules? He means to express certain sentiments; in order to do this properly, a selection must be made of the materials out of many thousands. He makes this selection without any expense of time or thought. The materials selected must be arranged in a particular order, according to innumerable rules of grammar, rhetoric, and logic, and accompanied with a particular tone and emphasis. He does all this as it were by inspiration, without thinking of any of those rules, and without breaking one of them.

"This art, if it were not so common, would appear more wonderful, than that a man should dance blindfold amidst a thousand burning ploughshares, without being burnt. Yet all this may be done by habit."

It must be owned, that it is difficult to conceive, that, in such a case as that the mind is capable of so many different acts in an interval of time so very inconsiderable?

With respect to this objection, it may be observed, in the first place, that all arguments against the foregoing doctrine with respect to our habitual exertions, in so far as they are founded on the inconceivable rapidity which they suppose in our intellectual operations, apply equally to the common doctrine concerning our perception of distance by the eye. But this is not all. To what does the supposition amount, which is considered as so incredible? Only to this, that the mind is so formed, as to be able to carry on certain intellectual processes, in intervals of time too short to be estimated by our faculties; a supposition which, so far from being extravagant, is supported by the analogy of many of our most certain conclusions in natural philosophy. The discoveries made by the microscope, have laid open to our senses a world of wonders, the existence of which hardly any man would have admitted upon inferior evidence; and have gradually prepared the way for those physical speculations, which explain some of the most extraordinary phenomena of nature, by means of modifications of matter far too subtile for the examination of our organs. Why then should it be considered as unphilosophical, after having demonstrated the existence of various intellectual processes which escape our attention in consequence of their rapidity, to carry the supposition a little further, in order to bring under the known laws of the human constitution a class of mental operations, which must otherwise remain perfectly inexplicable? Surely, *our ideas of time are merely relative, as well as our ideas of extension;* nor is there any good reason for doubting, that, if our powers of attention and memory were more perfect than they are, so as

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this, there is a separate act of the will accompanying all the intellectual operations here described; and therefore it is not surprising that some philosophers should have attempted to keep the difficulty out of sight, by the use of one of these convenient phrases to which it is not possible to annex a clear or a precise idea. This, at least, I must confess, is the case with me, with respect to the words *mechanical, automatical,* and *organical,* as employed on this occasion to give us the same advantage in examining rapid events, which the microscope gives for examining minute portions of extension, they would enlarge our views with respect to the intellectual world, no less than that instrument has with respect to the material.

It may contribute to remove, still more completely, some of the scruples which are naturally suggested by the foregoing doctrine, to remark, that, as the great use of attention and memory is to enable us to treasure up the results of our experience and reflection for the future regulation of our conduct, it would have answered no purpose for the Author of our nature to have extended their province to those intervals of time, which we have no occasion to estimate in the common business of life. All the intellectual processes I have mentioned are subservient to some particular end, either of perception or of action; and it would have been perfectly superfluous, if, after this end were gained, the steps which are instrumental in bringing it about, were all treasured up in the memory. Such a constitution of our nature would have had no other effect but to store the mind with a variety of useless particulars.

After all I have said, it will perhaps be still thought, that some of the reasonings I have offered are too hypothetical; and it is even possible, that some may be disposed rather to dispute the common theory of vision, than admit the conclusions I have endeavored to establish. To such readers, the following considerations may be of use, as they afford a more palpable instance than I have yet mentioned, of the rapidity with which the thoughts may be trained, by practice, to shift from one thing to another.

Instances of the quickness of mental operation. — When an equilibrist balances a rod upon his finger, not only the attention of his mind, but the observation of his eye, is constantly requisite. It is evident that the part of his body which supports the object is never wholly at rest; otherwise the object would no more stand upon it, than if placed in the same position upon a table. The equilibrist, therefore, must watch, in the very beginning, every inclination of the object from the proper position, in order to counteract this inclination by a contrary movement. In this manner, the object has never time to fall in any one direction, and is supported in a way somewhat analogous to that in which a top is supported on a pivot, by being made to spin upon an axis. That a person should be able to do this in the case of a single object, is curious; but that he should be able to balance, in the same way, two or three, upon different parts of his body, and at the same time balance himself on a small cord or wire, is indeed wonderful. Nor is it possible to conceive that, in such an instance, the mind, at one and the same moment, attends to these different equilibriums; for it is not merely the attention which is requisite, but the eye. We must therefore conclude that both of these, [the mind and the eye,] are directed successively to the different equilibriums, but change from one object to another with such velocity, that the effect, with respect to the experiment, is the same as if they were directed to all the objects constantly.

It is worth while to remark further, with respect to this last illustration, that it affords direct evidence of the possibility of our exerting acts of the will, which we are unable to recollect; for the movements of the equilibrist do not succeed each other in a regular order, like those of the harpsichord player in performing a piece of music; but must, in every instance, be regulated by accidents, which may vary in numberless respects, and which indeed must vary in numberless respects, every time he repeats the experiment: and therefore, although, in the former case, we should suppose, with Hartley, "that the motions cling to one another, and to the impressions of the notes, in the way of association, without any intervention of the state of mind called *will*," yet in this instance, even the possibility of such a supposition is directly contradicted by the fact.

The dexterity of jugglers (which, by the way, merits a greater degree of attention from philosophers, than it has yet attracted,) affords many curious illustrations of the same doctrine. The whole of this art seems to me to be founded on this principle; that it is possible for a person, by long practice, to acquire a power, not only of carrying on certain intellectual processes more quickly than other men, (for all the feats of legerdermain suppose the exercise of observation, thought, and volition,) but of performing a variety of movements with the hand, before the eyes of a company, in an interval of time too short to enable the spectators to exert that degree of attention which is necessary to lay a foundation for memory.*

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* Mr. Locke, in his Essay on Human Understanding, has taken notice of the quickness with which the operations of the mind are carried on, and has referred to the acquired perceptions of sight as a proof of it.

"We are further to consider, concerning perception, that the ideas we receive by sensation are often, in grown people, altered by the judgment, without our taking notice of it. When we set before our eyes a round globe of any uniform color, for example, gold, alabaster, or jet, it is certain that the idea thereby imprinted on our mind is of a flat circle, variously shadowed, with several degrees of light and brightness coming to our eyes. But we, having by use been accustomed to perceive what kind of appearance convex bodies are wont to make in us, and what alterations are made in the reflections of light by the difference of the sensible figure of bodies; the judgment presently, by a habitual custom, alters the appearances into their causes; so that, from that which truly is variety of shadow or color, collecting the figure, it makes it pass for a mark of figure, and frames to itself a perception of convex figure, and an uniform color; when the idea we receive from thence is only a plane variously colored; as is evident in painting." — Chap. ix. sec. 8.

"But this is not, I think, usual in any of our ideas but those received by sight; because sight, the most comprehensive of all our senses, conveying to our minds the ideas of lights and colors, which are peculiar only to that sense, and also the far different ideas of space, figure, and motion, the several varieties whereof change the appearances of its proper object, namely, light and colors, we bring ourselves by use to judge of the one by the other. This, in many cases, by a settled habit in things whereof we have frequent experience, is performed so constantly, and so quick, that we take that for the perception of our sensation, which is an idea formed by our judgment; so that one, namely, that of sensation, serves only to excite the other, and is scarce taken any notice of itself; as a man who reads or hears with attention and understanding, takes little notice of the character or sounds, but of the ideas that are excited in him by them.

"Nor need we wonder that this is done with so little notice, if we consider how very quick the actions of the mind are performed; for as itself is thought to take up no space, to have no extension, so its actions seem to require no time, but many of them seem to be crowded into an instant. I speak this in comparison with the actions of the body. Any one may

The will does not control the vital motions. — As some philosophers have disputed the influence of the will in the case of habits, so others (particularly Stahl and his followers) have gone into the opposite extreme, by referring to the will all the vital motions [such as the beating of the heart, the peristaltic

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easily observe this in his own thoughts, who will take the pains to reflect on them. How, as it were in an instant, do our minds, with one glance, see all parts of a demonstration, which may very well be called a long one, if we consider the time it will require to put it into words, and step by step show it to another? Secondly, we shall not be much surprised that this is done in us with so little notice, if we consider how the facility which we get of doing things by a custom of doing, makes them often pass in us without our notice. Habits, especially such as are begun very early, come at last to produce actions in us, which often escape our observation. How frequently do we in a day cover our eyes with our eyelids, without perceiving that we are at all in the dark! Men that by custom have got the use of a byword, do almost in every sentence pronounce sounds, which, though taken notice of by others, they themselves neither hear nor observe; and, therefore, it is not so strange that our mind should often change the idea of its sensation into that of its judgment, and make one serve only to excite the other, without our taking notice of it." — Ibid. secs. 9, 10.

The habit mentioned by Locke, in this paragraph, of occasionally winking with the eyelids, (which is not accompanied with any memory of our being, in every such instance, in a momentary state of total darkness,) deserves to be added to the cases already mentioned, to show the dependence of memory upon attention.

[Stewart and Locke are here mistaken in supposing that, when the eyelids wink, we are placed "in a momentary state of total darkness." It is a well ascertained fact, that impressions made upon the retina of the eye continue for about an eighth of a second after the object which produces them is removed. An obvious illustration of this fact is the familiar experiment of whirling round in a circle a stick which is tipped with fire; the sensation then produced is that of *a continuous circle of fire*, because the impression made by the fiery end at each point in the circle continues until the stick comes round to that point again. In winking, the eyelids being closed less than the eighth part of a second, the sensation of the light and of objects before us is not at all interrupted; no darkness is perceived. Just so, if a humming top, which has an orifice, about three-quarters of an inch square, in its periphery, is spun rapidly, the orifice becomes invisible, because the impression left by the unbroken portion of the periphery then becomes continuous.]

motion of the intestines, etc.] If it be admitted, say these philosophers, that there are instances in which we will an effect, without being able to make it an object of attention, is it not possible that, what we commonly call the vital and involuntary motions, may be the consequences of our own thought and volition? But there is surely a wide difference between those cases, in which the mind was at first conscious of thought and volition, and gradually lost the power of attending to them, from the growing rapidity of the intellectual process; and a case in which the effect itself is perfectly unknown to the bulk of mankind, even after they arrive at maturity, and in which this effect has continued to take place with the most perfect regularity, from the very beginning of their animal existence, and long before the first dawn of either reflection or experience.

Some of the followers of Stahl have stated the fact rather inaccurately, even in respect to our habitual exertions. Thus Dr. Porterfield, in his Treatise on the Eye, is at pains to prove that *the soul may think and will without knowledge or consciousness.* But this, I own, is to me inconceivable. The true state of the fact, I apprehend is, that *the mind may think and will, without attending* to its thoughts and volitions, *so as to be able afterwards to recollect* them. Nor is this merely a verbal criticism; for there is an important difference between consciousness and attention, which it is very necessary to keep in view, in order to think upon this subject with any degree of precision.* The one is an involuntary state of the mind; the other is a voluntary act; the one has no immediate connection with memory; but the other is so essentially subservient to it, that, without some degree of it, the ideas and perceptions which pass through the mind, seem to leave no trace behind them.†

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* The distinction between attention and consciousness is pointed out by Dr. Reid. "*Attention* is a voluntary act; it requires an active exertion to begin and to continue it, and it may be continued as long as we will; but *consciousness* is involuntary, and of no continuance, changing with every thought."

† [Here, and elsewhere, Stewart assumes too absolutely, that every act or movement is either entirely voluntary or entirely involuntary. But the

How the attention is distributed among simultaneous sensations. — When two persons are speaking to us at once, we can attend

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control which the will exercises, according to the best physiologists, is often partial or imperfect. "There are many *involuntary* movements," says Müller, an eminent physiologist, "performed by muscles which are [generally] subject to the will, — movements in some cases following as regular a rhythm as do the motions of the heart. Certain muscles also, which are quite independent of the influence of *the will*, are nevertheless influenced by particular *states of the mind*."

The *associate* or *consensual* movements are those "which, *contrary to our will*, accompany other, *voluntary*, motions. . . . Very few persons indeed can cause the different muscles of the face to act singly; they cannot, in most instances, make the individual muscles act, except in groups with other muscles." We find a difficulty in calling into action separately the different fingers of the same hand; in extending, for instance, the third or fourth finger without extending at the same time the first and second. The muscles of the eyes have this tendency to association; it is impossible, for example, to turn one eye downwards and the other outwards, or both outwards at the same time. When one eye is turned outwards, the other is always rotated involuntarily inwards. During violent bodily exertion, many muscles act by association, although their action shows no apparent purpose; a man using great muscular exertion moves the muscles of his face, as if they were aiding him in raising his load; during labored respiration, and in persons in a state of debility, the muscles of the face act simultaneously, but involuntarily; although, except by raising the "wings of the nostrils," they can in no way assist respiration.

"The less perfect the action of the nervous system," continues Müller, "the more frequently do associate motions occur. It is only by education that we acquire the power of confining the influence of volition in the production of voluntary motions to a certain number of nervous fibres issuing from the brain. An awkward person, in performing one voluntary movement, makes many others, which are produced involuntarily by consensual nervous action. In the piano-forte player, we have an example, on the other hand, of the faculty of insulation of the nervous influence in its highest perfection."

Now, if education and habit, as is here stated, can insulate movements which are by nature consensual, if they can enable us to perform separately motions which were originally associated, it would seem that education and habit might also associate acts which were at first independent of each other, or, in other words, might teach us to perform by a single effort of the will several movements each of which originally required a distinct volition. To adopt Stewart's illustration, the equilibrist or the rope-dancer may need but one volition to put in motion several distinct muscles whose to either of them at pleasure, without being much disturbed by the other. If we attempt to listen to both, we can understand neither. The fact seems to be, that when we attend constantly to one of the speakers, the words spoken by the other make no impression on the memory, in consequence of our not attending to them; and affect us as little as if they had not been uttered. This power, however, of the mind to attend to either speaker at pleasure, supposes that it is, at one and the same time, conscious of the sensations which both produce.

Another well-known fact may be of use in illustrating the same distinction. A person who accidentally loses his sight, never fails to improve gradually in the sensibility of his touch. Now, there are only two ways of explaining this. The one is, that, in consequence of the loss of the one sense, some change takes place in the physical constitution of the body, so as to improve a different organ of perception. The other, that the mind gradually acquires a power of attending to and remembering those slighter sensations of which it was formerly conscious, but which, from our habits of inattention, made no impression whatever on the memory. No one, surely, can hesitate for a moment, in pronouncing which of these two suppositions is the most philosophical.

Having treated, at considerable length, of those habits in which both mind and body are concerned, I proceed to make a few remarks on some phenomena which are purely intellectual; and which, I think, are explicable on the same principles with those which have been now under our review.

The influence of attention on memory illustrated by phenomena and habits purely intellectual. — Every person who has studied the elements of *geometry*, must have observed many cases in which *the truth of a theorem struck him the moment he heard the enunciation.* I do not allude to those theorems, the truth of

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joint action is necessary to enable him to recover his balance. The muscular contractions that were originally isolated come, as it were, to cling together, and take place under a single volition, as when *both* eyes turn to the right or left, or *all* the fingers of the hand open or shut, by one impulse.]

which is obvious almost to sense; such as, that any two sides of a triangle are greater than the third side; or that one circle cannot cut another circle in more than two points; but to some propositions with respect to quantity, considered abstractly, (to some, for example, in the fifth book of Euclid,) which almost every student would be ready to admit without a demonstration. These propositions, however, do by no means belong to the class of axioms; for their evidence does not strike every person equally, but requires a certain degree of quickness to perceive it. At the same time, it frequently happens, that although we are convinced the proposition is true, we cannot state immediately to others upon what our conviction is founded. In such cases, I think it highly probable, that before we give our assent to the theorem, *a process of thought has passed through the mind*, but has passed through it *so quickly, that we cannot, without difficulty, arrest our ideas in their rapid succession, and state them to others in their proper and logical order.* It is some confirmation of this theory, that there are no propositions of which it is more difficult to give a legitimate proof from first principles, than of those which are only removed a few steps from the class of axioms; and that those men who are the most remarkable for their quick perception of mathematical truth, are seldom clear and methodical in communicating their knowledge to others. A man of a moderate degree of quickness, the very first time he is made acquainted with the fundamental principles of the method of fluxions, or of the method of prime and ultimate ratios, is almost instantaneously satisfied of their truth; yet how difficult is it to demonstrate these principles rigorously!

What I have now said with respect to mathematics, may be applied in a great measure to the other branches of knowledge. How many questions daily occur to us, in *morals*, in *politics*, and in *common life;* in considering which we almost instantaneously see where the truth lies, although we are not in a condition, all at once, to explain the grounds of our conviction! Indeed, I apprehend, there are few, even among those who have devoted themselves to study, but who have not been habituated to communicate their knowledge to others, who are able to exhibit, in their natural order, the different steps of any investigation by which they have been led to form a particular conclusion. The common observation, therefore, that an obscure elocution always indicates an imperfect knowledge of the subject; although it may perhaps be true with respect to men who have cultivated the art of speaking, is by no means to be relied on as a general rule, in judging of the talents of those whose speculations have been carried on with a view merely to their own private satisfaction.

In the course of my own experience, I have heard of more than one instance, of men who, without any mathematical education, were able, on a little reflection, to give a solution of any simple algebraical problem; and who, at the same time, were perfectly incapable of explaining by what steps they obtained the result.* In these cases, we have a direct proof of the possibility of investigating even truths which are pretty remote, by an intellectual process which, as soon as it is finished, vanished almost entirely from the memory. It is probable, that something of the same kind takes place much more frequently in the other branches of knowledge, in which our reasonings consist commonly but of a few steps. Indeed, I am inclined to think, that it is in this way that by far the greater part of our speculative conclusions are formed.

There is no talent, I apprehend, so essential to a public speaker, as to be able to state clearly every different step of those trains of thought by which he himself was led to the conclusions he wishes to establish. Much may be here done by study and experience. Even in those cases in which the truth of a proposition seems to strike us instantaneously, although we may not be able, at first, to discover the media of proof, we seldom fail in the discovery by perseverance. Nothing contributes so much to form this talent as the study of metaphysics; not the absurd metaphysics of the schools, but that study which has the operations of the mind for its object. By habituating us to reflect on the subjects of our consciousness, it enables us to retard, in a considerable degree, the current of thought; to arrest many of those ideas, which would otherwise escape our notice; and to render the arguments which we employ for the conviction of others, an exact transcript of those trains of inquiry and reasoning, which originally led us to form our opinions.

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* [Prodigies of arithmetical ability, like Buxton and Zerah Colburn, have usually been found incapable of explaining the processes by which they performed their computations with such marvellous quickness.]

These observations lead me to take notice of *an important distinction between the intellectual habits of men of speculation and of action.* The latter, who are under a necessity of thinking and deciding on the spur of the occasion, are led to cultivate, as much as possible, a *quickness* in their mental operations; and sometimes acquire it in so great a degree, that *their judgment seems* to be almost *intuitive.* To those, on the other hand, who have not merely to form opinions for themselves, but to communicate them to others, it is necessary to retard the train of thought as it passes in the mind, so as to be able afterwards to recollect every different step of the process; a habit which, in some cases, has such an influence on the intellectual powers, that there are men who, even in their private speculations, not only make use of words as an instrument of thought, but form these words into regular sentences.

Contributions of philology to philosophy.—It may perhaps appear, at first, a paradoxical observation, that one great employment of philosophers, in a refined age, is to bring to light and arrange those rapid and confused trains of thought, which appear, from the structure of languages and from the monuments of ancient laws and governments, to have passed through the minds of men in the most remote and unenlightened periods. In proof, however, of this, it is sufficient to mention the systematical analogy which we find, to a certain degree, running through the structure of the most imperfect tongues, (for example, in the formation of the different parts of the verbs,) and those general principles which the philosophical lawyer traces amidst an apparent chaos of precedents and statutes. In the language, too, of the rudest tribe, we find words transferred from one subject to another, which indicate, in the mind of the individual who first made the transference, some perception of resemblance or of analogy. Such transferences can hardly be ascribed to accident, but may be considered as proofs that the analogies, which the philosopher afterwards points out between the objects which are distinguished by the same name, had been perceived by the inventors of language, although it is more than probable that they never expressed them in words, nor could even have explained them if they had been questioned on the subject.

Nor will this appear a bold or incredible supposition, if we reflect on the sagacity and ingenuity which savages, and even peasants, discover, in overcoming the difficulties which occur in their situation. They do not, indeed, engage in long processes of abstract reasoning, for which they have no inclination, and which it is impossible to carry on without the use of a cultivated and a copious language; but when pressed by present circumstances, they combine means to accomplish particular ends, in a manner which indicates the exercise both of invention and of reasoning. It is probable that such processes are carried on in their minds, with much less assistance from language, than a philosopher would derive on a similar occasion; and it is almost certain, that they would find themselves perfectly incapable of communicating to others the steps by which they were led to their conclusions. In consequence of these circumstances, the attainments of the human mind, in its ruder state, perish with the individual, without being recorded in writing, or perhaps expressed in words; and we are left to infer them indirectly from the structure of language, or from the monuments of ancient customs and institutions.

What trains of thought are most difficult to be remembered.—When a train of thought leads to any interesting conclusion, or excites any pleasant feeling, it becomes peculiarly difficult to arrest our fleeting ideas; because the mind, when once it has felt the pleasure, has little inclination to retrace the steps by which it arrived at it. This is one great cause of the difficulty attending philosophical criticism. When a critic explains to us why we are pleased with any particular beauty, or offended with any defect, it is evident, that if his theory be just, the circumstances which he points out as the foundation of our pleasure or uneasiness, must have occurred to our minds before we were pleased with the beauty, or offended with the defect. In such cases, it sometimes happens, when a critic has been fortunate in his theory, that we recognize at first sight our old ideas, and without any further consideration, are ready to bear testimony to the truth, from our own consciousness. So very difficult, however, is it to attend to the ideas which excite such feelings, that it often appears to be doubtful, whether a theory be right or wrong; and that where there is every reason to believe that the pleasure is produced in all men in the same way, different critics adopt different theories with respect to its cause. It is long practice alone, joined to what is commonly called a metaphysical turn of mind, (by which, I think, is chiefly to be understood a capacity of reflecting on the subjects of our consciousness,) that can render such efforts of attention easy. Exquisite sensibility, so far from being useful in this species of criticism, both gives a disrelish for the study, and disqualifies for pursuing it.

Inability to attend to more than one thing at once. — Before we leave the subject of attention, it is proper to take notice of a question which has been stated with respect to it; whether we have the power of attending to more than one thing at one and the same instant; or, in other words, whether we can attend at one and the same instant to objects which we can attend to separately? This question has, if I am not mistaken, been already decided by several philosophers in the negative; and I acknowledge for my own part, that although their opinion has not only been called in question by others, but even treated with some degree of contempt as altogether hypothetical, it appears to me to be the most reasonable and philosophical that we can form on the subject.

There is, indeed, a great variety of cases, in which the mind apparently exerts different acts of attention at once; but from the instances which have already been mentioned, of the astonishing rapidity of thought, it is obvious, that all this may be explained without supposing these acts to be coexistent; and I may even venture to add, it may all be explained in the most satisfactory manner, without ascribing to our intellectual operations a greater degree of rapidity than that with which we know, from the fact, that they are sometimes carried on. The effect of practice, in increasing this capacity of apparently attending to different things at once, renders this explanation of the phenomenon in question more probable than any other.

The case of the equilibrist and rope-dancer, already mentioned, is particularly favorable to this explanation; as it affords direct evidence of the possibility of the mind's exerting different successive acts in an interval of time so short, as to produce the same sensible effect as if they had been exerted at one and the same moment. In this case, indeed, the rapidity of thought is so remarkable, that if the different acts of the mind were not all necessarily accompanied with different movements of the eye, there can be no reason for doubting that the philosophers, whose doctrine I am now controverting, would have asserted, that they are all mathematically coexistent.

Upon a question, however, of this sort, which does not admit of a perfectly direct appeal to the fact, I would by no means be understood to decide with confidence; and therefore I should wish the conclusions I am now to state, to be received as only conditionally established. They are necessary and obvious consequences of the general principle, "that the mind can only attend to one thing at once;" but must stand or fall with the truth of that supposition.

Illustrations of this doctrine. — It is commonly understood, I believe, that, in *a concert of music,* a good ear can attend to the different parts of the music separately, or can attend to them all at once, and feel the full effect of the harmony. If the doctrine, however, which I have endeavored to establish, be admitted, it will follow, that in the latter case, the mind is constantly varying its attention from the one part of the music to the other, and that its operations are so rapid as to give us no perception of an interval of time.

The same doctrine leads to some curious conclusions with respect to *vision*. Suppose the eye to be fixed in a particular position, and the picture of an object to be painted on the retina. Does the mind perceive the complete figure of the object at once, or is this perception the result of the various perceptions we have of the different points in the outline? With respect to this question, the principles already stated lead me to conclude, that the mind does, at one and the same time, perceive every point in the outline of the object, (provided the whole of it be painted on the retina at the same instant;) for perception, like consciousness, is an involuntary operation. As no two points, however, of the outline are in the same direction, every point, by itself, constitutes just as distinct an object of attention to the mind, as if it were separated by an interval of empty space from all the rest. If the doctrine, therefore, formerly stated be just, it is impossible for the mind to attend to more than one of these points at once; and as the perception of the figure of the object implies a knowledge of the relative situation of the different points with respect to each other, we must conclude that the perception of figure by the eye is the result of a number of different acts of attention. These acts of attention, however, are performed with such rapidity, that the effect, with respect to us, is the same as if the perception were instantaneous.

In further confirmation of this reasoning, it may be remarked, that if the perception of visible figure were an immediate consequence of the picture on the retina, we should have, at the first glance, as distinct an idea of a figure of a thousand sides, as of a triangle or a square. The truth is, that when the figure is very simple, the process of the mind is so rapid, that the perception seems to be instantaneous; but when the sides are multiplied beyond a certain number, the interval of time necessary for these different acts of attention becomes perceptible.

It may perhaps be asked, what I mean by a *point* in the outline of a figure, and what it is that constitutes this point *one* object of attention? The answer, I apprehend, is, that this point is the *minimum visibile.* If the point be less, we cannot perceive it; if it be greater, it is not all seen in one direction.

If these observations be admitted, it will follow, that, without the faculty of memory, we could have had no perception of visible figure.*

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* I have been accused of overlooking, in the preceding Chapter, a very important distinction between Voluntary and Involuntary attention. In some cases, (it is said,) attention attaches itself spontaneously to its object. In others, it requires a painful effort to keep it steady, — nay, when we *will* to fix it on one subject, we find it perpetually wandering to another. The *fact* on which the criticism is founded must unquestionably be admitted, but the conclusion drawn from it is nevertheless erroneous. It proceeds on a vague use of the words *voluntary* and *involuntary.* These words, as well as the substantive *will,* are often, but very inaccurately, employed to express a general *purpose* or *intention,* as well as that state of mind which is the immediate antecedent of action. Thus, if I resolve to keep my eyes steadily open, I may, according to common modes of speech, be said to *will* to keep them open, and if in consequence of some sudden alarm, I should depart from my purpose, the winking of my eyelids may be said to be *involuntary.* And yet, in strict philosophical propriety, the winking of my eyelids is an act purely voluntary; an operation which I *will* to perform, in consequence of the effect which my alarm has to banish my general purpose or resolution from my mind. The case is perfectly parallel with respect to attention. When I am anxious to attend to a particular subject, I am apt to say that I *will* to attend to it, and when I forget my purpose, that my inattention is *involuntary;* whereas the fact is, that the unintended distraction, like the *unintended winking of the eyelids,* was the effect of a particular volition of the mind, exerted in consequence of a momentary forgetfulness of my *general purpose.* Indeed, to those who are at all accustomed to precision in the use of language, the phrase *involuntary attention* must appear a manifest contradiction in terms.

[Stewart is mistaken in supposing that the winking of the eyelids is *always,* or even *generally,* a voluntary act. Physiologists are now agreed that, most frequently, it is as involuntary as sneezing, or coughing from irritation of the larynx. Recent discoveries have established the existence of what is called *the reflex action* of the nerves, by which, without any sensation being communicated to the brain, and consequently without any effort of the will, an impression made upon the end of a nerve is transmitted to the spinal cord, and thence sent back again, as it were, along one of the motor nerves to its extremity, producing there a contraction of the nerves and the requisite movement of the limb or organ. Isolate this pair of nerves entirely, by cutting off its communication, not only with the head,

CHAPTER III.

OF CONCEPTION.

Office of Conception.—By conception, I mean that power of the mind, which enables it to form a notion of an absent object of perception; or of a sensation which it has formerly felt. I do not contend that this is exclusively the proper meaning of the word, but I think that the faculty which I have now defined, deserves to be distinguished by an appropriated name.

Conception is often confounded with other powers. When a painter makes a picture of a friend, who is absent or dead, he is commonly said to paint from memory; and the expression is sufficiently correct for common conversation. But in an analysis of the mind, there is ground for a distinction. The power of conception enables him to make the features of his friend an object of thought, so as to copy the resemblance; the power of memory recognizes these features as a former object of perception. Every act of memory includes an idea of the past; conception implies no idea of time whatever.*

According to this view of the matter, the word *conception* corresponds to what was called by the schoolmen *simple apprehension;* with this difference only, that they included, under this name, our apprehension of general propositions; whereas I

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but with the upper and lower portions of the spinal column, reserving only a segment of this column to connect the excitor with the motor nerve, and the reflex movement may still be produced. Thus, when the mucous membrane of the nose is irritated, sneezing follows in spite of any effort of the will to prevent it. Winking takes place involuntarily, whenever an object comes suddenly near or before the eyes, or when water needs to be carried off through the tear passage.]

* Shakspeare calls this power "the mind's eye."

Hamlet.—"My father! Methinks I see my father.
Horatio.—"Where, my Lord?
Hamlet.—"In my mind's eye, Horatio."—Act I. Scene 4.

should wish to limit the application of the word *conception* to our sensations, and the objects of our perceptions. Dr. Reid, in his Inquiry, substitutes the word *conception* instead of the *simple apprehension* of the schools, and employs it in the same extensive signification. I think it may contribute to make our ideas more distinct, to restrict its meaning: — and for such a restriction, we have the authority of philosophers in a case perfectly analogous. In ordinary language, we apply the same word, *perception*, to the knowledge which we have by our senses of external objects, and to our knowledge of speculative truth: and yet an author would be justly censured, who should treat of these two operations of the mind under the same article of perception. I apprehend there is as wide a difference between the conception of a truth, and the conception of an absent object of sense, as between the perception of a tree, and the perception of a mathematical theorem. I have therefore taken the liberty to distinguish also the two former operations of the mind; and under the article of *conception*, shall confine myself to that faculty whose province it is to enable us to form a notion of our *past* sensations, or of the objects of sense that we have *formerly perceived.**

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* [Stewart, who is a strict Nominalist, maintains that we can form a *conception* only of an individual object that can be perceived by the senses, — as of a particular *house* or *tree.* Reid and all other metaphysicians, except the Nominalists, maintain that we may have conceptions also of what abstract and general terms stand for; that is, they say we can *apprehend the meaning of* such words as *wisdom, virtue, courage,* etc., and also of *triangle, man, tiger,* — understanding thereby, not any particular triangle, or man, but the general idea answering to any or all triangles, any or all men, etc. If we did not apprehend their meaning, we could not argue about them, or use their names intelligibly. But the doctrine of the Nominalists is, that when we use these abstract, general terms, the mere *words* are our only objects of thought, and that we limit and fix the meaning of those words by calling up, when necessary, the image or conception of a particular thing comprehended under them. If I speak of *a triangle* in general, and wish to have something more definite before the mind than the mere *word* "triangle," they say that I call up the image of some particular triangle, and limit my attention, in considering it, to those qualities which it possesses in common with all triangles. According to the Nominalists,

Conception distinguished from Imagination. — Conception is frequently used as synonymous with imagination. Dr. Reid says, that "imagination, in its proper sense, signifies a lively conception of *objects of sight.*" "This is a talent," he remarks, "of importance to poets and orators; and deserves a proper name, on account of its connection with their arts." He adds, that "imagination is distinguished from conception as a part from the whole."

I shall not inquire at present into the proper English meaning of the words *conception* and *imagination.* In a study such as this, so far removed from common purposes of speech, some latitude may perhaps be allowed in the use of words; provided only we define accurately those we employ, and adhere to our own definitions.

The business of conception, according to the account I have given of it, is to present us with *an exact transcript of what we have felt or perceived.* But we have, moreover, a power of *modifying* our conceptions, by combining the parts of different ones together, so as to form new wholes of our own creation. I shall employ the word *imagination* to express this power; and, I apprehend, that this is the proper sense of the word, if imagination be the power which gives birth to the productions of the poet and the painter. This is not a simple faculty of the mind. It presupposes *abstraction,* to separate from each other qualities and circumstances which have been perceived in conjunction; and also *judgment* and *taste,* to direct us in forming the combinations. If they are made wholly at random, they are proofs of insanity.*

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then, the only objects of thought are (1.) mere words, and (2.) the conceptions of particular, material objects, such as can be *imaged* or *pictured forth* in the fancy. Reid and the Conceptualists maintain, that there are also (3.) conceptions of abstract and general things, — conceptions which are more definite than mere words, but less definite than images or pictures of particular objects.

But these differences of opinion between the Nominalists, Realists, and Conceptualists, will be explained more fully hereafter.]

* In common discourse, we often use the phrase of *thinking upon an object,* to express what I here call the *conception* of it. In the following passage

Some objects are conceived more easily than others. — The first remarkable fact which strikes us with respect to conception is, that we can conceive the objects of some senses much more easily than those of others. Thus we can conceive an absent *visible* object, such as a building that is familiar to us, much more easily than a particular *sound*, a particular *taste*, or a particular *pain*, which we have formerly felt. It is probable, however, that *this power might be improved* in the case of some of our senses. Few people, I believe, are able to form a very distinct conception of sounds; and yet it is certain, that by practice, a person may acquire a power of amusing himself with reading written music. And in the case of poetical numbers, it is universally known, that a reader may enjoy the harmony of the verse, without articulating the words, even in a whisper. In such cases, I take for granted, that our pleasure arises from *a very strong conception of the sounds* which we have been accustomed to associate with particular written characters.

Why visible objects are easily conceived. The peculiarity in the case of visible objects, seems to arise from this; that when we think of a sound or of a taste, the object of our conception is *one single detached sensation;* whereas every *visible object is complex;* and the conception which we form of it as a whole is aided by the Association of Ideas. To perceive the force of this observation, it is necessary to recollect what was formerly said on the subject of attention. As we cannot at one instant attend to every point of the picture of an object on the retina,

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Shakspeare uses the former of these phrases, and the words *imagination* and *apprehension* as synonymous with each other.

—— Who can hold a fire in his hand,
By *thinking on* the frosty Caucasus?
Or cloy the hungry edge of appetite,
By bare *imagination* of a feast?
Or wallow naked in December's snow,
By *thinking on* fantastic summer's heat?
Oh no! the *apprehension* of the good
Gives but the greater feeling to the worse.

K. Richard II. Act I Scene 6.

so, I apprehend, we cannot at one instant form a conception of the whole of any visible object; but that our conception of the object as a whole, is the result of many conceptions. The association of ideas connects the different parts together, and presents them to the mind in their proper arrangement; and the various relations which these parts bear to one another in point of situation, contribute greatly to strengthen the associations. It is some confirmation of this theory, that it is more easy to remember *a succession of sounds*, than *any particular sound* which we have heard detached and unconnected.

The power of conceiving visible objects, like all other powers that depend on the association of ideas, may be wonderfully improved by *habit.* A person accustomed to drawing retains a much more perfect notion of a building or of a landscape which he has seen, than one who has never practised that art. A portrait painter traces the form of the human body from memory, with as little exertion of attention, as he employs in writing the letters which compose his name.

In the power of conceiving *colors*, too, there are striking differences among individuals: and, indeed, I am inclined to suspect, that, in the greater number of instances, the supposed defects of sight in this respect ought to be ascribed rather to a defect in the power of conception. One thing is certain, that we often see men who are perfectly sensible of the difference between two colors when they are presented to them, who cannot give names to these colors, with confidence, when they see them apart; and are perhaps apt to confound the one with the other. Such men, it should seem, feel the sensation of color like other men, when the object is present, but are incapable (probably in consequence of some early habit of inattention) to conceive the sensation distinctly when the object is removed. Without this power of conception, it is evidently impossible for them, however lively their sensations may be, to give a name to any color; for the application of the name supposes not only a capacity of receiving the sensation, but a power of comparing it with one formerly felt. At the same time, I would not be understood by these observations to deny, that there are cases, in which there is a natural defect of the organ in the perception of color. In some cases, perhaps, the sensation is not felt at all; and in others, the faintness of the sensation may be one cause of those habits of inattention, from which the incapacity of conception has arisen.

What uses the power of conception is subservient to.—A talent for lively description, at least in the case of sensible objects, depends chiefly on the degree in which the describer possesses the power of conception. We may remark, even in common conversation, a striking difference among individuals in this respect. One man, in attempting to convey a notion of any object he has seen, seems to place it before him, and to paint from actual perception: another, although not deficient in a ready elocution, finds himself, in such a situation, confused and embarrassed among a number of particulars imperfectly apprehended, which crowd into his mind without any just order and connection. Nor is it merely to the accuracy of our descriptions that this power is subservient: it contributes more than any thing else to render them striking and expressive to others, by guiding us to a selection of such circumstances as are most prominent and characteristical; insomuch that I think it may reasonably be doubted, if a person would not write a happier description of an object from the conception than from the actual perception of it. It has been often remarked, that the perfection of description does not consist in a minute specification of circumstances, but in a judicious selection of them; and that the best rule for making the selection is to attend to the particulars that make the deepest impression on our own minds. When the object is actually before us, it is extremely difficult to compare the impressions which different circumstances produce; and the very thought of writing a description, would prevent the impressions which would otherwise take place. When we afterwards conceive the object, the representation of it we form to ourselves, however lively, is merely an outline; and is made up of those circumstances, which really struck us most at the moment; while others of less importance are obliterated. The impression, indeed, which a circumstance makes on the mind, will vary considerably with the degree of a person's taste; but I am inclined to think, that a man of lively conceptions, who paints from these, while his mind is yet warm from the original scene, can hardly fail to succeed in descriptive composition.

Observations applicable both to conception and imagination.— The facts and observations which I have now mentioned, are applicable to conception as distinguished from imagination. The two powers, however, are very nearly allied; and are frequently so blended, that it is difficult to say, to which of the two some particular operations of the mind are to be referred. There are also many general facts which hold equally with respect to both. The observations which follow, if they are well founded, are of this number, and might have been introduced with equal propriety under either article. I mention them here, as I shall have occasion to refer to them in the course of the following work, in treating of some subjects, which will naturally occur to our examination, before we have another opportunity of considering this part of our constitution.

On the belief which attends the conception or imagination.— It is a common, I believe I may say a universal, doctrine among logicians, that conception (or imagination, which is often used as synonymous with it) is attended with no belief of the existence of its object. "Perception," says Dr. Reid, "is attended with a belief of the present existence of its object; memory, with a belief of its past existence; but imagination is attended with no belief at all; and was therefore called by the schoolmen, *apprehensio simplex.*"

It is with great diffidence, that I presume to call in question a principle, which has been so generally received; yet there are several circumstances which lead me to doubt of it. If it were a specifical distinction between perception and imagination, that the former is always attended with belief, and the latter with none; then the more lively our imagination were of any object, and the more completely that object occupied the attention, the less would we be apt to believe its existence; for it is reasonable to think, that when any of our powers is employed separately from the rest, and there is nothing to withdraw the attention from it, the laws which regulate its operation will be most obvious to our observation, and will be most completely discriminated from those which are characteristical of the other powers of the mind. So very different, however, is the fact, that it is matter of common remark, that when imagination is very lively, we are apt to ascribe to its objects a real existence, as in the case of dreaming or of madness; and we may add, in the case of those who, in spite of their own general belief of the absurdity of the vulgar stories of apparitions, dare not trust themselves alone with their own imaginations in the dark. That imagination is in these instances attended with belief, we have all the evidence that the nature of the thing admits of; for we feel and act in the same manner as we should do, if we believed that the objects of our attention were real; which is the only proof that metaphysicians produce, or can produce, of the belief which accompanies perception.

In these cases, the fact that I wish to establish is so striking that it has never been called in question; but in most cases, the impression which the objects of imagination make on the mind is so momentary, and is so immediately corrected by the surrounding objects of perception, that it has not time to influence our conduct. Hence we are apt to conclude, on a superficial view, that imagination is attended with no belief; and the conclusion is surely just in most cases, if by belief we mean a *permanent* conviction which influences our conduct. But if the word be used in the strict logical sense, I am inclined to think, after the most careful attention to what I experience in myself, that the exercise both of conception and imagination is always accompanied with a belief that their objects exist.*

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* One of the arguments which I have stated, in opposition to the common doctrine concerning imagination, appears to me to be authorized, in some measure, by the following reasoning of Dr. Reid's on a different subject. In considering those sudden bursts of passion, which lead us to wreak our vengeance upon inanimate objects, he endeavors to show, that we have, in such cases, a momentary belief that the object is alive. "I confess," says he, "it seems to be impossible, that there should be resent-

When a painter conceives the face and figure of an absent friend, in order to draw his picture, he believes for the moment that his friend is before him. The belief, indeed, is only momentary; for it is extremely difficult, in our waking hours, to keep up a steady and undivided attention to any object we conceive or imagine; and as soon as the conception or the imagination is over, the belief which attended it is at an end. We find that we can recall and dismiss the objects of these powers at pleasure; and therefore we learn to consider them as creations of the mind, which have no separate and independent existence.

The compatibility of such *a speculative disbelief*, as I have here supposed, of the existence of an object, with *a contrary momentary belief*, may perhaps be more readily admitted, if the following experiment be considered with attention.

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ment against a thing, which, at that very moment, is considered as inanimate; and consequently incapable either of intending hurt, or of being punished. There must, therefore, I conceive, be some momentary notion or conception, that the object of our resentment is capable of punishment."

In another passage, the same author remarks, that "men may be governed, in their practice, by a belief, which, in speculation, they reject."

"I knew a man," says he, "who was as much convinced as any man, of the folly of the popular belief of apparitions in the dark: yet he could not sleep in a room alone, nor go alone into a room in the dark. Can it be said, that his fear did not imply a belief of danger? This is impossible. Yet his philosophy convinced him, that he was in no more danger in the dark when alone, than with company. Here an unreasonable belief, which was merely a prejudice of the nursery, stuck so fast as to govern his conduct, in opposition to his speculative belief as a philosopher and a man of sense.

"There are few persons who can look down from the battlement of a very high tower without fear; while their reason convinces them, that they are in no more danger than when standing upon the ground."

These facts are easily explicable, on the supposition, that whenever the objects of imagination engross the attention wholly, (which they may do, in opposition to any speculative opinion with respect to their non-existence,) they produce a temporary belief of their reality. Indeed, in the last passage, Dr. Reid seems to admit this to be the case; for, to say that a man who has a dread of apparitions, believes himself to be in danger when left alone in the dark, is to say, in other words, that he believes (for the time) that the objects of his imagination are real.

Suppose a lighted candle to be so placed before a concave mirror, that the image of the flame may be seen between the mirror and the eye of the observer. In this case, a person who is acquainted with the principles of optics, or who has seen the experiment made before, has so strong a speculative conviction of the non-existence of the object in that place where he sees its image, that he would not hesitate to put his finger to the apparent flame, without any apprehension of injury.

Suppose, however, that in such a case it were possible for the observer to banish completely from his thoughts all the circumstances of the experiment, and to confine his attention wholly to his perception; would he not believe the image to be a reality? and would he not expect the same consequences from touching it, as from touching a real body in a state of inflammation? If these questions be answered in the affirmative, it will follow; that the effect of the perception, *while it engages the attention completely to itself*, is to produce belief; and that the speculative disbelief, according to which our conduct in ordinary cases is regulated, is the result of a recollection of the various circumstances with which the experiment is accompanied.

If, in such a case as I have now supposed, the appearance exhibited to us is of such a nature as to threaten us with any immediate danger, the effect is the same as if we were to banish from our thoughts the circumstances of the experiment, and to limit our attention solely to what we perceive: for here the belief, which is the first effect of the perception, alarms our fears, and influences our conduct, before reflection has time to operate. In a very ingenious optical deception, which was lately exhibited in this city, the image of a flower was presented to the spectator; and when he was about to lay hold of it with his hand, a stroke was aimed at him by the image of a dagger. If a person who has seen this experiment is asked, in his cooler moments, whether or not he believes the dagger which he saw to be real, he will readily answer in the negative; and yet the accurate statement of the fact undoubtedly is, that the first and the proper effect of the perception is belief; and that the disbelief he feels is the effect of subsequent reflection.

The speculative disbelief which we feel with respect to the illusions of imagination, I conceive to be analogous to our speculative disbelief of the existence of the object exhibited to the eye in this optical deception; as our belief that the illusions of imagination are real, while that faculty occupied the mind exclusively, is analogous to the belief produced by the optical deception while the attention is limited to our perception, and is withdrawn from the circumstances in which the experiment is made.

On the belief which attends perception. — These observations lead me to take notice of a circumstance with respect to the belief accompanying *perception*, which it appears to me necessary to state, in order to render Dr. Reid's doctrine on that subject completely satisfactory. He has shown, that certain sensations are, by a law of our nature, accompanied with an irresistible belief of the existence of certain qualities of external objects. But this law extends no further than to the *present* existence of the quality; that is, to its existence *while we feel the corresponding sensation.* Whence is it then, that we ascribe to the quality an existence independent of our perception? I apprehend we learn to do this by experience alone. We find that we cannot, as in the case of imagination, dismiss or recall the perception of an external object. If I open my eyes, I cannot prevent myself from seeing the prospect which is before me. I learn, therefore, to ascribe to the objects of my senses, not only an existence at the time I perceive them, but an independent and a permanent existence.

In sleep and madness, imagination is fully believed. — It is a strong confirmation of this doctrine, that in sleep, when (as I shall endeavor afterwards to show) the influence of the will over the train of our thoughts is suspended, and when, of consequence, the time of their continuance in the mind is not regulated by us, we ascribe to the objects of imagination an independent and permanent existence, as we do when awake to the objects of perception. The same thing happens in those kinds of madness, in which a particular idea takes possession of the attention, and occupies it to the exclusion of every thing else. Indeed, madness seems in many cases to arise entirely from a suspension of the influence of the will over the succession of our thoughts; in consequence of which, the objects of imagination appear to have an existence independent of our volition; and are therefore, agreeably to the foregoing doctrine, mistaken for realities.

Numberless other illustrations of the same general fact occur to me; but the following is, I think, one of the most striking. I mention it in preference to the rest, as it appears to me to connect the doctrine in question with some principles which are now universally admitted among philosophers.

Office of conception in vision. — The distinction between the *original* and the *acquired* perceptions of *sight*, is familiarly known to every one who has the slightest acquaintance with the elements of optics. That this sense, prior to experience, conveys to us the notion of *extension in two dimensions only*, and that it gives us no information concerning the *distances* at which objects are placed from the eye, are propositions which nobody, I presume, in the present state of science, will be disposed to controvert. In what manner we are enabled, by a comparison between the perceptions of *sight* and those of *touch*, to extend the province of the former sense to a variety of qualities originally perceived by the latter sense only, optical writers have explained at great length; but it is not necessary for my present purpose to enter into any particular details with respect to their reasonings on the subject. It is sufficient for me to remark, that, according to the received doctrine, the original perceptions of sight become, in consequence of experience, signs of the tangible qualities of external objects, and of the distances at which they are placed from the organ; and that, although the knowledge we obtain, in this manner, of these qualities and distances, seems, from early and constant habits, to be an instantaneous perception; yet, in many cases, it implies an exercise of the judgment, being founded on a comparison of a variety of different circumstances.*

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* [See note to page 50, respecting the perception of distance by the eye. "If a sphere of one uniform color be set before me," says Dr. Reid, "it

From these principles, it is an obvious consequence, that the knowledge we obtain, by the eye, of the tangible qualities of bodies, involves the exercise of *conception*, according to the definition of that power which has already been given. In ordinary discourse, indeed, we ascribe this knowledge, on account of the instantaneousness with which it is obtained, to the power of *perception;* but if the common doctrine on the subject be just, it is the result of a complex operation of the mind; comprehending, *first*, the *perception* of those qualities, which are the proper and original objects of sight; and, *secondly*, the *conception* of those tangible qualities of which the original perceptions of sight are found from experience to be the signs. The notions, therefore, we form, by means of the eye, of the tangible qualities of bodies, and of the distances of these objects from the organ, are mere conceptions; strongly, and indeed indissolubly, associated, by early and constant habit, with the original perception of sight.

When we open our eyes on a magnificent prospect, the various distances at which all its different parts are placed from the eye, and the immense extent of the whole scene before us, seem to be perceived as immediately, and as instantaneously, by the mind, as the colored surface which is painted on the retina. The truth, however, unquestionably is, that this variety of distance, and this immensity of extent, are *not objects of sense, but of conception;* and the notions we form of them when our eyes are open, differ from those we should form of

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is certain that, by the original power of sight, I could not perceive it to be a sphere and to have three dimensions [length, breadth, and thickness]. The eye originally could perceive only two dimensions, [length and breadth,] and a gradual variation of color on the different sides of the object. It is *experience* that teaches me that the variation of color is an effect of spherical convexity, and of the distribution of light and shade. A sphere may be painted upon a plane so exactly as to be taken for a real sphere, when the eye is at a proper distance and in the proper point of view. The variation of color exhibited to the eye by the painter's art is the same which nature exhibits by the different degrees of light falling upon the convex surface of a sphere."]

them with our eyes shut only in this, that they are kept steadily in the view of the mind, by being strongly associated with the sensations of color, and with the original perceptions of sight. This observation will be the more readily admitted, if it be considered, that, by a skilful imitation of a natural landscape, in a common show-box, the mind may be led to form the same notions of variety of distance, and even of immense extent, as if the original scene were presented to our senses: and that, although, in this case, we have a speculative conviction that the sphere of our vision only extends to a few inches; yet so strong is the association between the original perceptions of sight, and the conceptions which they habitually produce, that it is not possible for us, by an effort of our will, to prevent these conceptions from taking place.

From these observations it appears, that, when the conceptions of the mind are rendered steady and permanent, by being strongly associated with any sensible impression, they command our belief no less than our actual perceptions; and, therefore, if it were possible for us, with our eyes shut, to keep up, for a length of time, the conception of any sensible object, we should, as long as this effort continued, believe that the object was present to our senses.

Various phenomena explained upon these principles. — It appears to me to be no slight confirmation of these remarks, that although, in the dark, the illusions of imagination are much more liable to be mistaken for realities, than when their momentary effects on the belief are continually checked and corrected by the objects which the light of day presents to our perceptions; yet, *even total darkness is not so alarming* to a person impressed with the vulgar stories of apparitions, *as a faint and doubtful twilight,* which affords to the conceptions an opportunity of fixing and prolonging their existence, by attaching themselves to something which is obscurely exhibited to the eye. In like manner, when we look through a fog, we are frequently apt to mistake a crow for a man; and the conception we have, upon such an occasion, of the human figure, is much more distinct and much more steady, than it would be possible for us to form, if we had no sensible object before us; insomuch that when, on a more attentive observation, the crow shrinks to its own dimensions, we find it impossible, by any effort, to conjure up the phantom which a moment before we seemed to perceive.

If these observations are admitted, *the effects which exhibitions of fictitious distress produce* on the mind, will appear less wonderful, than they are supposed to be. During the representation of a tragedy, I acknowledge, that we have a general conviction that the whole is a fiction; but, I believe, it will be found, that the violent emotions which are sometimes produced by the distresses of the stage, take their rise, in most cases, from a momentary belief, that the distresses are real. I say, in most cases; because, I acknowledge, that, independently of any such belief, there is something contagious in a faithful expression of any of the passions.

The emotions produced by tragedy are, upon this supposition, somewhat analogous to *the dread we feel when we look down from the battlement of a tower.** In both cases, we have a gen-

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* With respect to the dread which we feel in looking down from the battlement of a tower, it is curious to remark the effects of habit in gradually destroying it. The manner in which habit operates in this case, seems to be by giving us a command over our thoughts, so as to enable us to withdraw our attention from the precipice before us, and direct it to any other object at pleasure. It is thus that the mason and the sailor not only can take precautions for their own safety, but remain completely masters of themselves, in situations where other men, engrossed with their imaginary danger, would experience a total suspension of their faculties. Any strong passion which occupies the mind, produces, for the moment, the same effect with habit. A person alarmed with the apprehension of fire, has been known to escape from the top of a house by a path, which, at another time, he would have considered as impracticable; and soldiers, in mounting a breach, are said to have sometimes found their way to the enemy, by a route which appeared inaccessible after their violent passions had subsided.

From the principles which I have endeavored to establish in this chapter, may be derived a simple, and I think, a satisfactory, explanation of the manner in which superstition, considered in contradistinction to genuine religion, operates on the mind. The gloomy phantoms which she presents to her victims in their early infancy; and which consist chiefly of images eral conviction, that there is no ground for the feelings we experience; but the momentary influences of imagination are so powerful as to produce these feelings, before reflection has time to come to our relief.

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or representations of spectres and demons, and of invisible scenes of horror, produce their effect, *not* through the medium of reasoning and judgment, but of the powers of conception and imagination. No argument is alleged to prove their existence; but strong and lively notions of them are conveyed; and, in proportion as this is done, the belief of them becomes steady and habitual. It is even sufficient in many cases, to resist all the force of argument to the contrary, or, if it yields to it during the bustle of business and the light of day, its influence returns in the hours of solitude and darkness. When the mind, too, is weakened by disease, or the infirmities of age, and when the attention ceases to be occupied with external objects, the thoughts are apt to revert to their first channel, and to dwell on the conceptions to which they were accustomed in the nursery. "Let custom," says Locke, "from the very childhood, have joined figure and shape to the idea of God, and what absurdities will that mind be liable to about Deity!" A person of a lively but somewhat gloomy imagination once acknowledged to me, that he could trace some of his superstitious impressions with respect to the Deity, to the stern aspect of a judge whom he had seen, when a school-boy, pronounce sentence of death upon a criminal. Hence it would appear, that he who has the power of modelling the habitual conceptions of an infant mind, is, in a great measure the arbiter of its future happiness or misery. By guarding against the spectres conjured up by superstitious weakness, and presenting to it only images of what is good, lovely, and happy, he may secure through life a perpetual sunshine to the soul, and may perhaps make some provision against the physical evils to which humanity is exposed. Even in those awful diseases which disturb the exercise of reason, I am apt to think, that the complexion of *madness*, in point of gayety or of despondency, depends much on the nature of our first conceptions: and it would surely be no inconsiderable addition to the comfort of any individual to know, that some provision had been made by the tender care of his first instructors, to lighten the pressure of this greatest of all earthly calamities, if it ever should be his lot to bear it. In truth, the only effectual antidote against superstitious weakness is to inspire the mind with just and elevated notions of the administration of the universe; for we may rest assured, that religion, in one form or another, is the natural and spontaneous growth of man's intellectual and moral constitution; and the only question in the case of individuals is, whether, under the regulation of an enlightened understanding, it is to prove the best solace of life and the surest support

CHAPTER IV.

OF ABSTRACTION.

I. *General Observations on this Faculty of the Mind.*

The origin of general terms.—The origin of appellatives, or, in other words, the origin of those classes of objects which, in the schools, are called *genera* and *species*, has been considered by some philosophers as one of the most difficult problems in metaphysics. The account of it which is given by Mr. Smith, in his dissertation on the Origin of Languages, appears to me to be equally simple and satisfactory.

"The assignation," says he, "of particular names, to denote particular objects; that is, the institution of nouns substantive; would probably be one of the first steps towards the formation of language. The particular cave, whose covering sheltered the savage from the weather; the particular tree, whose fruit relieved his hunger; the particular fountain, whose water allayed his thirst; would first be denominated by the words, cave, tree, fountain; or by whatever other appellations he might think proper, in that primitive jargon, to mark them. Afterwards, when the more enlarged experience of this savage had led him to observe, and his necessary occasions obliged him to make mention of, other caves, and other trees, and other fountains; he would naturally bestow, upon each of those new objects, the same name by which he had been accustomed to express the similar object he was first acquainted with. And thus, those

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of virtue, or to be converted, by the influence of prejudices and a diseased imagination, into a source of imbecility, inconsistency, and suffering.

words, which were originally the proper names of individuals, would each of them insensibly become the common name of a multitude."

"It is this application," he continues, "of the name of an individual to a great number of objects, whose resemblance naturally recalls the idea of that individual, and of the name which expresses it, that seems originally to have given occasion to the formation of those classes, and assortments, which, in the schools, are called *genera* and *species;* and of which the ingenious and eloquent Rousseau finds himself so much at a loss to account for the origin. What constitutes a *species,* is merely a number of objects, bearing a certain degree of resemblance to one another; and, on that account, denominated by a single appellation, which may be applied to express any one of them."

This view of the natural progress of the mind, in forming classifications of external objects, receives some illustration from a fact mentioned by Captain Cook, in his account of a small island called Wateeoo, which he visited in sailing from New Zealand to the Friendly Islands. "The inhabitants," says he, "were afraid to come near our cows and horses, nor did they form the least conception of their nature. But the sheep and goats did not surpass the limits of their ideas; for they gave us to understand that they knew them to be birds. It will appear," he adds, "rather incredible, that human ignorance could ever make so strong a mistake, there not being the most distant similitude between a sheep or goat, and any winged animal. But these people seemed to know nothing of the existence of any other land animals, besides hogs, dogs, and birds. Our sheep and goats, they could see, were very different creatures from the two first, and therefore they inferred that they must belong to the latter class, in which they knew that there is a considerable variety of species." I would add to Cook's very judicious remarks, that the mistake of these islanders probably did not arise from their considering a sheep or a goat as bearing a more striking resemblance to a bird, than to the two classes of quadrupeds with which they were acquainted; but to the want of a generic word, such as *quadruped,* comprehending these two species; which men in their situation would no more be led to form, than a person who had only seen one individual of each species, would think of an appellative to express both, instead of applying a proper name to each. In consequence of the variety of birds, it appears, that they had a generic name comprehending all of them, to which it was not unnatural for them to refer any new animal they met with.

The process of abstraction explained.—The classification of different objects supposes a power of attending to some of their qualities or attributes, without attending to the rest; for no two objects are to be found without some specific difference; and no assortment or arrangement can be formed among things not perfectly alike, but by losing sight of their distinguishing peculiarities, and limiting the attention to those attributes which belong to them in common. Indeed, without this power of attending separately to things which our senses present to us in a state of union, we never could have had any idea of *number;* for, before we can consider different objects as forming a multitude, it is necessary that we should be able to apply to all of them one common name; or, in other words, that we should reduce them all to the same genus. The various objects, for example, animate and inanimate, which are, at this moment before me, I may class and number in a variety of different ways, according to the view of them that I choose to take. I may reckon successively the number of sheep, of cows, of horses, of elms, of oaks, of beeches; or I may first reckon the number of animals, and then the number of trees; or I may first reckon the number of all the organized substances which my senses present to me. But whatever be the principle on which my classification proceeds, it is evident that the objects numbered together must be considered in those respects only in which they agree with each other; and that, if I had no power of separating the combinations of sense, I never could have conceived them as forming a plurality.

This power of considering certain qualities or attributes of an object apart from the rest; or, as I would rather choose to define it, *the power which the understanding has of separating the combinations which are presented to it*, is distinguished by logicians by the name of *abstraction.* It has been supposed, by some philosophers, (with what probability I shall not now inquire,) to form the characteristical attribute of a rational nature. That it is one of the most important of all our faculties, and very intimately connected with the exercise of our reasoning powers, is beyond dispute.

Usefulness of the power of abstraction. — The subserviency of abstraction to the power of reasoning, and also its subserviency to the exertions of a poetical or creative imagination, shall be afterwards fully illustrated. At present, it is sufficient for my purpose to remark, that as abstraction is the groundwork of classification, without this faculty of the mind we should have been perfectly incapable of general speculation, and all our knowledge must necessarily have been limited to individuals; and that some of the most useful branches of science, particularly the different branches of mathematics, in which the very subjects of our reasoning are abstractions of the understanding, could never have possibly had an existence. With respect to the subserviency of this faculty to poetical imagination, it is no less obvious, that, as the poet is supplied with all his materials by experience, and as his province is limited to combine and modify things which really exist, so as to produce new wholes of his own; so, every exertion which he thus makes of his powers, presupposes the exercise of abstraction in decomposing and separating actual combinations. And it was on this account that, in the chapter on conception, I was led to make a distinction between that faculty, which is evidently simple and uncompounded, and the power of imagination, which (at least in the sense in which I employ the word in these inquiries) is the result of a combination of various other powers.

I have introduced these remarks, in order to point out a difference between the abstractions which are subservient to *reasoning*, and those which are subservient to *imagination.* And, if I am not mistaken, it is a distinction which has not been sufficiently attended to by some writers of eminence. In every instance in which imagination is employed in forming new wholes, by decompounding and combining the conceptions of sense, it is evidently necessary that the poet or the painter should be able to state to himself the circumstances abstracted, as separate objects of conception. But this is by no means requisite in every case in which abstraction is subservient to the power of reasoning; for it frequently happens, that *we can reason concerning one quality or property of an object abstracted from the rest, while, at the same time, we find it impossible to conceive it separately.* Thus, I can reason concerning extension and figure, without any reference to color; although it may be doubted, if a person possessed of sight can make extension and figure steady objects of conception, without connecting with them one color or another. Nor is this always owing (as it is in the instance now mentioned) merely to the association of ideas; for there are cases, in which we can reason concerning things separately, which it is impossible for us to suppose any being so constituted as to conceive apart. Thus, we can reason concerning length, abstracted from any other dimension; although, surely, no understanding can make length, without breadth, an object of conception. And, by the way, this leads me to take notice of an error, which mathematical teachers are apt to commit, in explaining the first principles of geometry. By dwelling long on Euclid's first definitions, they lead the student to suppose that they relate to notions which are extremely mysterious; and to strain his powers in fruitless attempts to conceive, what cannot possibly be made an object of conception. If these definitions were omitted, or very slightly touched upon, and the attention at once directed to geometrical reasonings, the student would immediately perceive, that although the lines in the diagrams are really extended in two dimensions, yet that the demonstrations relate only to one of them; and that the human understanding has the faculty of reasoning concerning things separately, which are always presented to us, both by our powers of perception and conception, in a state of union. Such abstractions, in truth, are familiar to the most illiterate of mankind; and it is in this very way that they are insensibly formed. When a tradesman speaks of the length of a room, in contradistinction to its breadth; or when he speaks of the distance between any two objects, he forms exactly the same abstraction which is referred to by Euclid in his second definition, and which most of his commentators have thought it necessary to illustrate by prolix metaphysical disquisitions.

Abstraction is possible without generalization. — I shall only observe further with respect to the nature and province of this faculty of the mind, that notwithstanding its essential subserviency to every act of classification, yet it might have been exercised, although we had only been acquainted with one individual object. Although, for example, we had never seen but one rose, we might still have been able to attend to its color, without thinking of its other properties. This has led some philosophers to suppose, that another faculty besides abstraction, to which they have given the name of generalization, is necessary to account for the formation of genera and species; and they have endeavored to show, that although generalization without abstraction is impossible, yet that we might have been so formed as to be able to abstract without being capable of generalizing. The grounds of this opinion it is not necessary for me to examine, for any of the purposes which I have at present in view.*

II. *Of the Objects of our Thoughts, when we employ general terms. Further consideration of the ideal theory.* — From the account which was given in a former chapter of the common theories of perception, it appears to have been a prevailing opinion among philosophers, that the qualities of external objects are perceived by means of images or species transmitted to the mind by the organs of sense; an opinion of which I already endeavored to trace the origin, from certain natural prejudices suggested by the phenomena of the material world. The same train of thinking has led them to suppose, that, in the case of all our other intellectual operations, there exist in the mind certain ideas distinct from the mind itself; and that these ideas are the objects about which our thoughts are employed. When I recollect, for example, the appearance of an absent friend, it is supposed that the immediate object of my thoughts is an *idea* of my friend, which I at first received by my senses, and which I have been enabled to retain in the mind by the faculty of memory. When I form to myself any imaginary combination by an effort of poetical invention, it is supposed, in like manner, that the parts which I combine, existed previously in the mind, and furnish the materials on which it is the province of imagination to operate. It is to Dr. Reid we owe the important remark, that all these notions are wholly hypothetical; that it is impossible to produce a shadow of evidence in support of them; and that, even although we were to admit their truth, they would not render the phenomena in question more intelligible. According to his principles, therefore, we have no ground for supposing, that, in any one operation of the mind, there exists in it an object distinct from the mind itself; and all the common expressions which involve such a supposition, are to be considered as unmeaning circumlocutions, which serve only to disguise from us the real history of the intellectual phenomena.*

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* The words *abstraction* and *generalization* are commonly, but improperly, used as synonymous: and the same inaccuracy is frequently committed in speaking of abstract or general ideas, as if the two expressions were convertible. A person who had never seen but one rose (it has been already remarked) might yet have been able to consider its *color* apart from its other qualities; and therefore, (to express myself in conformity to common language,) there may be such a thing as an idea which is at once abstract and particular. After having perceived this quality as belonging to a variety of individuals, we can consider it without reference to any of them, and thus form the notion of redness or whiteness in general, which may be called *a general abstract idea.* These words *abstract* and *general,* therefore, when applied to ideas, are as completely distinct from each other as any two words to be found in the language.

It is indeed true, that the formation of every general notion presupposes abstraction; but it is surely improper on this account, to call a general term an abstract term, or a general idea an abstract idea.

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* In order to prevent misapprehensions of Dr. Reid's meaning in his reasonings against the ideal theory, it may be necessary to explain, a little more fully than I have done in the text, in what sense he calls in question the existence of *ideas;* for the meaning which the word is employed to convey in popular discourse, differs widely from that which is annexed to it by the philosophers whose opinion he controverts. This explanation I shall give in his own words: —

"We are at a loss to know," says this excellent philosopher, "how we perceive distant objects; how we remember things past; how we imagine things that have no existence. Ideas in the mind seem to account for all these operations; they are all by the means of ideas reduced to one operation; to a kind of feeling, or immediate perception of things present, and in contact with the percipient; and feeling is an operation so familiar, that we think it needs no explanation, but may serve to explain other operations.

"But this feeling, or immediate perception, is as difficult to be comprehended, as the things which we pretend to explain by it. Two things may be in contact, without any feeling of perception; there must, therefore, be in the percipient, a power to feel, or to perceive. How this power is produced, and how it operates, is quite beyond the reach of our knowledge. As little can we know, whether this power must be limited to things present, and in contact with us. Neither can any man pretend to prove, that the Being who gave us the power to perceive

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"In popular language, *idea* signifies the same thing as conception, apprehension, notion. To have an idea of any thing, is to conceive it. To have a distinct idea, is to conceive it distinctly. To have no idea of it, is not to conceive it at all. When the word idea is taken in this popular sense, no man can possibly doubt whether he has ideas.

"According to the philosophical meaning of the word *idea,* it does not signify that *act of the mind* which we call thought, or conception, but some *object* of thought. Of these objects of thought called ideas, different sects of philosophers have given very different accounts.

"Some have held them to be self-existent; others, to be in the divine mind; others, in our own minds; and others, in the brain, or sensorium." —p. 213.

I don't know of any author who, prior to Dr. Reid, has expressed himself on this subject with so much justness and precision as Father Buffier, in the following passage of his Treatise on *First Truths.*

"If we confine ourselves to what is intelligible in our observations on *Ideas,* we will say, they are nothing but mere modifications of the mind as a thinking being. They are called *ideas* with regard to the object represented; and *perception,* with regard to the faculty representing. It is manifest that our ideas, considered in this sense, are not more distinguished from our understanding than motion is from a body moved."

things present, may not give us the power to perceive things distant, to remember things past, and to conceive things that never existed."

What ideas correspond to general terms. — As in all the ancient metaphysical systems it was taken for granted, (probably from the analogy of our external perceptions,) that every exertion of thought implies the existence of an object distinct from the thinking being; it naturally occurred, as a very curious question, What is the immediate object of our attention, when we are engaged in any general speculation; or, in other words, what is the nature of the idea corresponding to a general term? When I think of any particular object which I have formerly perceived, such as a particular friend, a particular tree, or a particular mountain, I can comprehend what is meant by a picture or representation of such objects: and therefore the explanation given by the ideal theory of that act of the mind which we formerly called conception, if not perfectly satisfactory, is at least not wholly unintelligible. But what account shall we give upon the principles of this theory, of the objects of my thoughts, when I employ the words *friend*, *tree*, *mountain*, as generic terms? For, that all the things I have ever perceived are individuals; and consequently, that the ideas denoted by general words, (if such ideas exist,) are not copied from any originals that have fallen under my observation, is not only self-evident, but almost an identical proposition.

Opinions of the ancients on this subject. — In answer to this question, the Platonists, and, at a still earlier period, the Pythagoreans taught, that although these universal ideas are not copied from any objects perceivable by sense, yet that they have an existence independent of the human mind, and are no more to be confounded with the understanding, of which they are the proper objects, than material things are to be confounded with our powers of external perception; that as all the individuals which compose a genus must possess something in common; and as it is in consequence of this that they belong to that genus, and are distinguishable by the same name, this common thing forms the *essence* of each, and is the object of the understanding, when we reason concerning the genus. They maintained also, that this common *essence*,* notwithstanding its inseparable union with a multitude of different individuals, is, in itself, one and indivisible.

On most of these points, the philosophy of Aristotle seems to have coincided very nearly with that of Plato. The language, however, which these philosophers employed on this subject was different, and gave to their doctrines the appearance of a wider diversity than probably existed between their opinions. While Plato was led, by his passion for the marvellous and the mysterious, to insist on the incomprehensible union of the same idea or essence with a number of individuals, without multiplication or division; † Aristotle, more cautious, and aiming at greater perspicuity, contented himself with saying, that all individuals are composed of *matter* and *form;* and that it is in consequence of possessing *a common form*, that different individuals belong to the same genus. But they both agreed, that as the matter, or the individual natures, of objects were perceived by sense; so the *general idea*, or *essence*, or *form*, was perceived by the intellect; and that, as the attention of the vulgar was chiefly engrossed with the former, so the latter furnished to the philosopher the materials of his speculations.

The chief difference between the opinions of Plato and Aristotle on the subject of ideas, related to the mode of their existence. That *the matter* of which all things are made, *existed from eternity*, was a principle which both admitted; but Plato further taught, that of every species of things, there is an *idea of form* which also existed from eternity; and that *this idea is the exemplar, or model, according to which the individuals of the species were made;* whereas Aristotle held, that, although matter may exist without form, yet that forms could not exist without matter.

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* In this very imperfect sketch of the opinions of the ancients concerning universals, I have substituted, instead of the word *idea*, the word *essence*, as better fitted to convey to a modern reader the true import of Plato's expressions. The word *essentia* is said to have been first employed by Cicero; and it was afterwards adopted by the schoolmen, in the same sense in which the Platonists used the word *idea*.

† "The idea of a thing," says Plato, "is that which makes *one* of the *many;* which, preserving the unity and integrity of its own nature, runs through and mixes with things infinite in number; and yet, however multiform it may appear, is always the same: so that by it we find out and discriminate the thing, whatever shapes it may assume, and under whatever disguise it may conceal itself."

Opinions of the philosophers of the Middle Ages. — As it is not my object, in this work, to enter into historical details, any further than is necessary for illustrating the subjects of which I treat, I shall pass over the various attempts which were made by the Eclectic philosophers, (a sect which arose at Alexandria, about the beginning of the third century,) to reconcile the doctrines of Plato and Aristotle, concerning ideas. The endless difficulties, it would appear, to which their speculations led, induced, at last, the more cautious and modest inquirers to banish them entirely from Dialectics, and to content themselves with studying the arrangements or classifications of universals, which the ancient philosophers had made, without engaging in any metaphysical disquisitions concerning their nature. Porphyry, in particular, although he tells us that he has speculated much on this subject, yet, in his Introduction to Aristotle's Categories, waives the consideration of it as obscure and intricate. On such questions as these: "Whether genera and species exist in nature, or are only conceptions of the human mind; and (on the supposition that they exist in nature) whether they are inherent in the objects of sense, or disjoined from them?" he declines giving any determination.

This passage in Porphyry's Introduction is an object of curiosity; as by a singular concurrence of circumstances, it served to perpetuate the memory of a controversy from which it was the author's intention to divert the inquiries of his readers. Amidst the disorders produced by the irruptions of the barbarians, the knowledge of the Greek tongue was almost entirely lost; and the studies of philosophers were confined to Latin versions of Aristotle's Dialectics, and Porphyry's Introduction concerning the Categories. With men who had a relish for such disquisitions, it is probable that the passage already quoted from

Porphyry, would have a tendency rather to excite than to damp curiosity; and accordingly we have reason to believe, that the controversy to which it relates continued, during the dark ages, to form a favorite subject of discussion. The opinion which was prevalent was, (to use the scholastic language of the times,) that universals do not exist *before* things, nor *after* things, but *in* things; that is, (if I may be allowed to attempt a commentary upon expressions to which I do not pretend to be able to annex very precise notions,) universal ideas have not (as Plato thought) an existence separable from individual objects; and therefore they could not have existed prior to them in the order of time; nor yet, (according to the doctrine of the Stoics,) are they mere conceptions of the mind, formed in consequence of an examination and comparison of particulars; but these ideas or forms are from eternity united inseparably with that matter of which things consist; or, as the Aristotelians sometimes express themselves, the forms of things are from eternity immersed in matter. The reader will, I hope, forgive me for entering into these details, not only on account of their connection with the observations which are to follow; but as they relate to a controversy which, for many ages, employed all the ingenuity and learning in Europe; and which, therefore, however frivolous in itself, deserves the attention of philosophers, as one of the most curious events which occur in the history of the human mind.

Such appears to have been the prevailing opinion concerning the nature of universals, till the eleventh century; when a new doctrine, or (as some authors think) a doctrine borrowed from the school of Zeno, was proposed by Roscelinus; and soon after very widely propagated over Europe by the abilities and eloquence of one of his scholars, the celebrated Peter Abelard. According to these philosophers, there are no existences in nature corresponding to general terms; and the objects of our attention in all of our general speculations are not ideas, but words.

In consequence of this new doctrine, the schoolmen gradually formed themselves into two sects; one of which attached itself to the opinions of Roscelinus and Abelard, while the other adhered to the principles of Aristotle. Of these sects, the former are known in literary history by the name of the *Nominalists*, the latter, by that of the *Realists*.

As it is with the doctrine of the Nominalists that my own opinion on this subject coincides, and as I propose to deduce from it some consequences, which appear to me important, I shall endeavor to state it as clearly and precisely as I am able, pursuing, however, rather the train of my own thoughts, than guided by the reasons of any particular author.

The doctrine of the Nominalists stated and defended. — I formerly explained in what manner the words, which, in the infancy of language, were proper names, became gradually appellatives; in consequence of which extension of their signification, they would express, when applied to individuals, those qualities only which are common to the whole genus. Now, it is evident, that, with respect to individuals of the same genus, there are two classes of truths; the one, particular truths relating to each individual apart, and deduced from a consideration of its peculiar and distinguishing properties; the other, general truths, deduced from a consideration of their common qualities, and equally applicable to all of them. Such truths may be conveniently expressed by means of general terms; so as to form propositions, comprehending under them as many particular truths, as there are individuals comprehended under the general terms. It is further evident, that there are *two ways in which such general truths may be obtained; either by fixing the attention on one individual, in such a manner that our reasoning may involve no circumstances but those which are common to the whole genus; or, (laying aside entirely the consideration of things,) by means of the general terms with which language supplies us.* In either of these cases, our investigations must necessarily lead us to general conclusions. In the *first* case, our attention being limited to those circumstances, in which the subject of our reasoning resembles all other individuals of the same genus, whatever we demonstrate with respect to this subject must be true of every other to which the same attributes belong. In the *second* case, the subject of our reasoning being expressed by a generic word, which applies in common to a number of individuals, the conclusion we form must be as extensive in its application, as the name of the subject is in its meaning. The former process is analogous to the practice of *geometers*, who, in their most general reasonings, direct the attention to a particular diagram; the latter, to that of *algebraists*, who carry on their investigations by means of symbols.* In cases of this last sort, it may frequently happen, from the association of ideas, that *a general word may recall some one individual to which it is applicable:* but this is so far from being necessary to the accuracy of our reasoning, that, excepting in some cases, in which it may be useful to check us in the abuse of general terms, it always has a tendency, more or less, to mislead us from the truth. As the decision of a judge must necessarily be impartial, when he is only acquainted with the relations in which the parties stand to each other, and when their names are supplied by letters of the alphabet, or by the fictitious names of Titus, Caius, and Sempronius; so, in every process of reasoning, the conclusion we form is most likely to be logically just, when the attention is confined solely to signs; and when the imagination does not present to it those individual objects, which may warp the judgment by casual associations.

To these remarks, it may not be improper to add, that, although in our speculations concerning individuals, it is possible to carry on processes of reasoning by fixing our attention on the objects themselves, without the use of language; yet it is also in our power to accomplish the same end, by substituting for these objects, words, or other arbitrary signs. The difference between the employment of language in such cases, and in our speculations concerning classes or genera, is, that in the former case, the use of words is, in a great measure, optional; whereas, in the latter, it is essentially necessary. This observation deserves our attention the more, that, if I am not mistaken, it has contributed to mislead some of the Realists, by giving rise to an idea, that the use of language, in thinking about universals, however convenient, is not more necessary than in thinking about individuals.

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* These two methods of obtaining general truths proceed on the same principles, and are, in fact, much less different from each other, than they appear to be at first view. When we carry on a process of general reasoning by fixing our attention on a particular individual of a genus, this individual is to be considered merely as *a sign or representative,* and differs from any other sign only in this, that it bears a certain resemblance to the things it denotes. The straight lines, which are employed in the fifth book of Euclid to represent magnitudes in general, differ from the algebraical expressions of these magnitudes in the same respects in which picture-writing differs from arbitrary characters.

According to this view of the process of the mind, in carrying on general speculations, that IDEA, which the ancient philosophers considered as the essence of an individual, is nothing more than the particular quality or qualities in which it resembles other individuals of the same class; and in consequence of which, a generic name is applied to it. It is the possession of this quality, that entitles the individual to the generic appellation, and which, therefore, may be said to be essential to its classification with that particular genus; but as all classifications are to a certain degree arbitrary, it does not necessarily follow, that it is more essential to its existence as an individual, than various other qualities which we are accustomed to regard as accidental. In other words, (if I may borrow the language of modern philosophy,) this quality forms its *nominal*, but not its *real* essence.

These observations will, I trust, be sufficient for the satisfaction of such of my readers as are at all conversant with philosophical inquiries. For the sake of others, to whom this disquisition may be new, I have added the following illustrations.

All reasoning may take place by symbols, or arbitrary signs, alone.—I shall have occasion to examine, in another part of my work, how far it is true, (as is commonly believed,) that every process of reasoning may be resolved into a series of syllogisms; and to point out some limitations, with which, I apprehend, it is necessary that this opinion should be received. As it would lead me, however, too far from my present subject, to anticipate any part of the doctrine which I am then to propose, I shall, in the following remarks, proceed on the supposition, that the syllogistic theory is well founded; a supposition which, although not strictly agreeable to truth, is yet sufficiently accurate for the use which I am now to make of it. Take, then, any step of one of Euclid's demonstrations; for example, the first step of his first proposition, and state it in the form of a syllogism. "All straight lines, drawn from the centre of a circle to the circumference, are equal to one another." "But A B, and C D, are straight lines drawn from the centre of a circle to the circumference. Therefore, A B is equal to C D." It is perfectly manifest, that, in order to feel the force of this conclusion, it is by no means necessary, that I should annex any particular notions to the letters A B, or C D, or that I should comprehend what is meant by *equality*, or by a *circle*, its *centre*, and its *circumference*. Every person must be satisfied, that the truth of the conclusion is necessarily implied in that of the two premises, whatever the particular things may be to which these premises may relate. In the following syllogism, too: "All men must die; Peter is a man; therefore Peter must die;" the evidence of the conclusion does not in the least depend on the particular notions I annex to the words *man* and *Peter;* but would be equally complete, if we were to substitute, instead of them, two letters of the alphabet, or any other insignificant characters. "All X's must die; Z is an X; therefore Z must die;"—is a syllogism which forces the assent no less than the former. It is further obvious, that this syllogism would be equally conclusive, if, instead of the word *die*, I were to substitute any other verb that the language contains; and, that, in order to perceive the justness of the inference, it is not even necessary that I should understand its meaning.

In general, it might be easily shown, that all the rules of logic with respect to syllogisms, might be demonstrated, without having recourse to any thing but letters of the alphabet; in the same manner, (and I may add, on the very same principles,) on which the algebraist demonstrates, by means of these letters, the various rules for transposing the terms of an equation.

From what has been said, it follows, that the assent we give to the conclusion of a syllogism does not result from any examination of the notions expressed by the different propositions of which it is composed, but is an immediate consequence of the relations in which the words stand to each other. The truth is, that in every syllogism, the inference is only a particular instance of the general axiom, that whatever is true universally of any sign, must also be true of every individual which that sign can be employed to express. Admitting, therefore, that every process of reasoning may be resolved into a series of syllogisms, it follows, that this operation of the mind furnishes no proof of the existence of any thing corresponding to general terms, distinct from the individuals to which these terms are applicable.

These remarks, I am very sensible, do, by no means, exhaust the subject; for there are various modes of reasoning, to which the syllogistic theory does not apply. But, in all of them, without exception, it will be found on examination, that the evidence of our conclusions appears immediately from the consideration of the words in which the premises are expressed; without any reference to the things which they denote. The imperfect account which is given of deductive evidence, in the received systems of logic, makes it impossible for me, in this place, to prosecute the subject any further.

After all I have said on the use of language as an instrument of reasoning, I can easily foresee a variety of objections, which may occur to the doctrine I have been endeavoring to establish. But without entering into a particular examination of these objections, I believe I may venture to affirm, that most, if not all, of them take their rise from confounding reasoning, or deduction, properly so called, with certain other intellectual processes, which it is necessary for us to employ in the investigation of truth. That it is *frequently of essential importance* to us, in our speculations, *to withdraw our attention from words, and to direct it to the things they denote*, I am very ready to acknowledge. All that I assert is, that, in so far as our speculations consist of that process of the mind which is properly called *reasoning*, they *may be carried on by words alone;* or, which comes to the same thing, that every process of reasoning is perfectly analogous to an algebraical operation. What I mean by "the other intellectual processes distinct from reasoning, which it is necessary for us sometimes to employ in the investigation of truth," will, I hope, appear clearly from the following remarks.

Mental operations subsidiary to reasoning. — In *algebraical* investigations, it is well known, that the practical application of a general expression is frequently limited by the conditions which the hypothesis involves; and that, in consequence of a want of attention to this circumstance, some mathematicians of the first eminence have been led to adopt the most paradoxical and absurd conclusions. Without this cautious exercise of the judgment in the interpretation of the algebraical language, no dexterity in the use of the calculus will be sufficient to preserve us from error. Even in algebra, therefore, there is an application of the intellectual powers perfectly distinct from any process of reasoning, and which is absolutely necessary for conducting us to the truth.

In *Geometry*, we are not liable to adopt the same paradoxical conclusions, as in algebra; because the diagrams, to which our attention is directed, serve as a continual check on our reasoning powers. These diagrams exhibit, to our very senses, a variety of relations among the quantities under consideration, which the language of algebra is too general to express; in consequence of which, we are not conscious of any effort of the judgment distinct from a process of reasoning. As every geometrical investigation, however, may be expressed algebraically, it is manifest, that in geometry, as well as in algebra, there is an exercise of the intellectual powers, distinct from the logical process; although, in the former science, it is rendered so easy, by the use of diagrams, as to escape our attention.

The same source of error and of absurdity, which exists in algebra, is to be found, in a much greater degree, in the other branches of knowledge. Abstracting entirely from the ambiguity of language, and supposing also our reasonings to be logically accurate, it would still be necessary for us, from time to time, in all our speculations, to *lay aside the use of words, and to* *have recourse to particular examples or illustrations, in order to correct and to limit our general conclusions.* To a want of attention to this circumstance, a number of the speculative absurdities which are current in the world might, I am persuaded, be easily traced.

Besides, however, this source of error, which is in some degree common to all the sciences, there is a great variety of others, from which mathematics are entirely exempted; and which perpetually tend to lead us astray in our philosophical inquiries. Of these, the most important is, that *ambiguity in the signification of words*, which renders it so difficult to avoid employing the same expressions in different senses, in the course of the same process of reasoning. This source of mistake, indeed, is apt, in a much greater degree, to affect our conclusions in metaphysics, morals, and politics, than in the different branches of natural philosophy; but if we except mathematics, there is no science whatever, in which it has not a very sensible influence. In algebra, we may proceed with perfect safety through the longest investigations, without carrying our attention beyond the signs, till we arrive at the last result. But in the other sciences, excepting in those cases in which we have fixed the meaning of all our terms by accurate definitions, and have rendered the use of these terms perfectly familiar to us by very long habit, it is but seldom that we can proceed in this manner, without danger of error. In many cases, it is necessary for us to keep up, during the whole of our investigations, a scrupulous and constant attention to the signification of our expressions; and in most cases, this caution in the use of words is a much more difficult effort of the mind, than the logical process. But still this furnishes no exception to the general doctrine already delivered; for the attention we find it necessary to give to the import of our words arises only from the accidental circum stance of their ambiguity, and has no essential connection with *that process of the mind which is properly called reasoning;* and *which consists in the inference of a conclusion from premises.* In all the sciences, this process of the mind is perfectly analogous to an algebraical operation; or, in other words, (when the meaning of our expressions is once fixed by definitions,) it may be carried on entirely by the use of signs, without attending, during the time of the process, to the things signified.

The conclusion to which the foregoing observations lead, appears to me to be decisive of the question, with respect to the objects of our thoughts when we employ general terms; for if it be granted, that words, even when employed without any reference to their particular signification, form an instrument of thought sufficient for all the purposes of reasoning; the only shadow of an argument in proof of the common doctrine on the subject, (I mean that which is founded on the impossibility of explaining this process of the mind on any other hypothesis,) falls to the ground. Nothing less, surely, than a conviction of this impossibility, could have so long reconciled philosophers to an hypothesis unsupported by any direct evidence; and acknowledged, even by its warmest defenders, to involve much difficulty and mystery.

Uses of illustrated and abstract reasoning.—It does not fall within my plan to enter, in this part of my work, into a particular consideration of the practical consequences which follow from the foregoing doctrine. I cannot, however, help remarking the importance of cultivating, on the one hand, a talent for ready and various illustration; and, on the other, a habit of reasoning by means of general terms. The former talent is necessary, not only for correcting and limiting our general conclusions, but for enabling us to apply our knowledge, when occasion requires, to its real practical use. The latter serves the double purpose, of preventing our attention from being distracted during the course of our reasonings, by ideas which are foreign to the point in question, and of diverting the attention from those conceptions of particular objects and particular events which might disturb the judgment, by the ideas and feelings which are apt to be associated with them, in consequence of our own casual experience.

This last observation points out to us, also, one principal foundation of the art of the orator. As his object is not so much to inform and satisfy the understandings of his hearers, as to force their immediate assent; it is frequently of use to him to clothe his reasonings in that specific and figurative language, which may either awaken in their minds associations favorable to his purpose, or may divert their attention from a logical examination of his argument. A process of reasoning so expressed, affords at once an exercise to the judgment, to the imagination, and to the passions; and is apt, even when loose and inconsequential, to impose on the best understandings.

It appears further, from the remarks which have been made, that the perfection of philosophical language, considered either as an instrument of thought, or as a medium of communication with others, consists in the use of expressions, which, from their generality, have no tendency to awaken the powers of conception and imagination; or, in other words, it consists in its approaching, as nearly as possible, in its nature, to the language of algebra. And hence the effects which long habits of philosophical speculation have in weakening, by disuse, those faculties of the mind, which are necessary for the exertions of the poet and the orator; and of gradually forming a style of composition, which they who read merely for amusement, are apt to censure for a want of vivacity and of ornament.*

III. *Remarks on the opinions of some modern philosophers on the subject of the foregoing section.* — After the death of Abelard, through whose abilities and eloquence the sect of Nominalists had enjoyed, for a few years, a very splendid triumph, the system of the Realists began to revive; and it was soon so completely reëstablished in the schools, as to prevail, with little or no opposition, till the fourteenth century. What the circumstances were, which led philosophers to abandon a doctrine, which seems so strongly to recommend itself by its simplicity, it is not very easy to conceive. Probably the heretical opinions, which had subjected both Abelard and Roscelinus to the censure of the Church, might create a prejudice also against their philosophical principles; and probably, too, the manner in which these principles were stated and defended was not the clearest, nor the most satisfactory. The principal cause, however, I am disposed to think, of the decline of the sect of Nominalists, was their want of some palpable example, by means of which they might illustrate their doctrine. It is by the use which algebraists make of the letters of the alphabet in carrying on their operations, that Leibnitz and Berkeley have been most successful in explaining the use of language as an instrument of thought: and, as in the twelfth century, the algebraical art was entirely unknown, Roscelinus and Abelard must have been reduced to the necessity of conveying their leading idea by general circumlocutions; and must have found considerable difficulty in stating it in a manner satisfactory to themselves; a consideration, which, if it accounts for the slow progress which this doctrine made in the world, places in the more striking light the genius of those men whose sagacity led them, under so great disadvantages, to approach to a conclusion so just and philosophical in itself, and so opposite to the prevailing opinions of their age.

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* "Language, like light, is a medium: and the true philosophical style, like light from a north window, exhibits objects clearly and distinctly without soliciting attention to itself. In painting subjects of amusement indeed, language may gild somewhat more, and color with the dyes of fancy; but where information is of more importance than entertainment, though you cannot throw *too strong* a light, you should carefully avoid a *colored* one. The style of some writers resembles a bright light placed between the eye, and the thing to be looked at. The light shows itself, and hides the object." — *Gilpin.*

In the fourteenth century, this sect seems to have been almost completely extinct; their doctrine being equally reprobated by the two great parties which then divided the schools, the followers of Duns Scotus and of Thomas Aquinas. These, although they differed in their manner of explaining the nature of universals, and opposed each other's opinions with much asperity, yet united in rejecting the doctrine of the Nominalists, not only as absurd, but as leading to the most dangerous consequences. At last, William Occam, a native of England, and a scholar of Duns Scotus, revived the ancient controversy, and, with equal ability and success, vindicated the long-abandoned philosophy of Roscelinus. From this time the dispute was carried on with great warmth in the universities of France, of Germany, and of England, more particularly in the two former countries, where the sovereigns were led, by some political views, to interest themselves deeply in the contest, and even to employ the civil power in supporting their favorite opinions. The Emperor Lewis of Bavaria, in return for the assistance which, in his disputes with the Pope, Occam had given to him by his writings, sided with the Nominalists. Lewis the Eleventh of France, on the other hand, attached himself to the Realists, and made their antagonists the objects of a cruel persecution.

The dispute to which the foregoing observations relate, although, for some time after the Reformation, interrupted by theological disquisitions, has been since occasionally revived by different writers, and, singular as it may appear, it has not yet been brought to a conclusion in which all parties are agreed. The names, indeed, of Nominalists and Realists exist no longer: but the point in dispute between these two celebrated sects, coincides precisely with a question which has been agitated in our own times, and which has led to one of the most beautiful speculations of modern philosophy

Doctrines and conclusions of the later Nominalists. — Of the advocates who have appeared for the doctrine of the Nominalists, since the revival of letters, the most distinguished are Hobbes, Berkeley, and Hume. The first has, in various parts of his works, reprobated the hypothesis of the Realists, and has stated the opinions of their antagonists with that acuteness, simplicity, and precision, which distinguish all his writings.*

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* "The universality of one name to many things, hath been the cause that men think the things themselves are universal; and so seriously contend, that, besides Peter and John, and all the rest of the men that are, have been, or shall be, in the world, there is yet something else that we call man, namely, Man in general; deceiving themselves, by taking the universal or general appellation for the thing it signifieth. For if one should desire the painter to make him the picture of a *man,* which is as much as to say, of a *man in general,* he meaneth no more but that the painter should choose what man he pleaseth to draw, which must needs be some of them that are, or have been, or may be: none of which are universal. But when we would have him to draw the picture of the king, or

The second, considering (and, in my opinion, justly) the doctrines of the ancients concerning universals, in support of which so much ingenuity had been employed by the Realists, as the great source of mystery and error in the abstract sciences, was at pains to overthrow it completely, by some very ingenious and original speculations of his own. Mr. Hume's * view on the subject, as he himself acknowledges, does not differ materially from that of Berkeley; whom, by the way, he seems to have regarded as the author of an opinion, of which he was only an expositor and defender, and which, since the days of Roscelinus and Abelard, has been familiarly known in all the universities of Europe.

Notwithstanding, however, the great merit of these writers in defending and illustrating the system of the Nominalists, none of them seem to me to have been fully aware of the important consequences to which it leads. The Abbé de Condillac was, I believe, the first (if we except, perhaps, Leibnitz), who perceived that, if this system be true, *a talent for reasoning must consist*, in a great measure, *in a skilful use of language as an instrument of thought.* The most valuable of his remarks on this subject are contained in a treatise, On the Art of Thinking, which forms the fourth volume of his "Course of Study."

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any particular person, he limiteth the painter to that one person he chooseth. It is plain, therefore, that there is *nothing universal but names,* which are therefore called indefinite, because we limit them not ourselves, but leave them to be applied by the hearer; whereas a singular name is limited and restrained to one of the many things it signifieth; as when we say, *this* man, pointing to him, or giving him his proper name, or by some such other way." — Hobbes's *Tripos,* chap. v. sect. 6.

* "A very material question has been started concerning abstract or general ideas, Whether they be general or particular in the mind's conception of them? A great philosopher has disputed the received opinion in this particular; and has asserted, that all general ideas are nothing but particular ones annexed to a certain term, which gives them a more extensive signification, and makes them recall, upon occasion, other individuals, which are similar to them. As I look upon this to be one of the greatest and most valuable discoveries that have been made of late years in the republic of letters, I shall here endeavor to confirm it by some arguments, which I hope will put it beyond all doubt and controversy." — Treatise of Human Nature, Book i. part i. sect. 7.

Refutation of Dr. Price's arguments. — The explanation which the doctrines of these writers afford, of the process of the mind in general reasoning, is so simple, and at the same time, in my apprehension, so satisfactory, that I own it is with some degree of surprise I have read the attempts which have lately been made to revive the systems of the Realists. One of the ablest of these attempts is by Dr. Price, who, in his very valuable "Treatise on Morals," has not only employed his ingenuity in support of some of the old tenets of the Platonic school, but has even gone so far as to follow Plato's example, in connecting this speculation about universals with the sublime questions of natural theology. The observations which he has offered in support of these opinions, I have repeatedly perused with all the attention in my power, but without being able to enter into his views, or even to comprehend fully his meaning. Indeed, I must acknowledge that it appears to me to afford no slight presumption against the principles on which he proceeds, when I observe, that an author, remarkable, on most occasions, for precision of ideas and for perspicuity of style, never fails to lose himself in obscurity and mystery when he enters on these disquisitions.

Dr. Price's reasonings in proof of the existence of universals, are the more curious, as he acquiesces in some of Dr. Reid's conclusions with respect to the ideal theory of perception. That there are, in the mind, images or resemblances of things external, he grants to be impossible; but still he seems to suppose, that in every exertion of thought, there is *something* immediately present to the mind, which is the object of its attention. "When abstract truth is contemplated, is not," says he, "the very object itself present to the mind? When millions of intellects contemplate the equality of every angle in a semicircle to a right angle, have they not all the same object in view? Is this object nothing? or is it only an image, or kind of shadow? These inquiries," he adds, "carry our thoughts high." *

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* The whole passage is as follows: "The word *idea* is sometimes used to signify the immediate object of the mind in thinking, considered as

The difficulty which has appeared so puzzling to this ingenious writer, is, in truth, more apparent than real. In the case of perception, imagination, and memory, it has been already fully shown, that we have no reason to believe the existence of any thing in the mind distinct from the mind itself; and that, even upon the supposition that the fact were otherwise, our intellectual operations would be just as inexplicable as they are at present. Why then should we suppose, that in our general speculations, there must exist in the mind some object of its thoughts, when it appears that there is no evidence of the existence of any such object, even when the mind is employed about individuals?

How we reason about classes of objects. — Still, however, it may be urged, that although, in such cases, there should be no object of thought in the mind, there must exist something or other to which its attention is directed. To this difficulty I have no answer to make, but by repeating the fact which I have already endeavored to establish; that there are only *two* ways in which we can possibly speculate about classes of objects; *the one, by means of a word or generic term; the other, by means of one particular individual of the class which we consider as the representative of the rest;* and that these two methods of carrying on our general speculations, are at bottom so much the

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something in the mind which represents the real object, but is different from it. This sense of an *idea* is derived from the notion, that when we think of any external existence, there is something immediately present to the mind, which it contemplates distinct from the object itself, that being at a distance. But what is this? It is bad language to call it an image in the mind of the object. Shall we say then, that there is indeed no such thing? But would not this be the same as to say that, when the mind is employed in viewing and examining any object, which is either not present to it, or does not exist, it is employed in viewing and examining nothing, and therefore does not then think at all? When abstract truth is contemplated, is not the very object itself present to the mind? When millions of intellects contemplate the equality of every angle in a semicircle to a right angle, have they not all the same object in view? Is this object nothing? or is it only an image, or kind of shadow? These inquiries carry our thoughts high."

same, as to authorize us to lay down as a principle, that, without the use of signs, all our thoughts must have related to individuals. When we reason, therefore, concerning classes or genera, the objects of our attention are merely signs; or if, in any instance, the generic word should recall some individual, this circumstance is to be regarded only as the consequence of an accidental association, which has rather a tendency to disturb, than to assist us in our reasoning.

Whether it might not have been possible for the Deity to have so formed us, that we might have been capable of reasoning concerning classes of objects, without the use of signs, I shall not take upon me to determine. But this we may venture to affirm with confidence, that man is not such a being. And, indeed, even if he were, it would not therefore necessarily follow, that there exists any thing in a genus, distinct from the individuals of which it is composed; for we know that the power which we have of thinking of particular objects without the medium of signs, does not in the least depend on their existence or non-existence at the moment we think of them.

It would be vain, however, for us, in inquiries of this nature, to indulge ourselves in speculating about possibilities. It is of more consequence to remark the advantages which we derive from our actual constitution, and which, in the present instance, appear to me to be important and admirable; inasmuch as it fits mankind for an easy interchange of their intellectual acquisitions, by imposing on them *the necessity of employing, in their solitary speculations, the same instrument of thought, which forms the established medium of their communications with each other.**

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* [See note to page 77.

It must be admitted, that, in other passages of his philosophical writings, Stewart does not seem to be always mindful of the doctrine which he has here labored to establish. Take the following, for instance, from "Note Q" to the First Part of his Dissertation on the Progress of Metaphysical Philosophy. In answer to a remark by Bonnet, that privation of one of the senses entails a loss of all the ideas usually obtained through that sense, he says, " The question is not about our ideas of the *material* world, but about

The doctrine of the Conceptualists. — In the very slight sketch which I have given of the controversy between the Nominalists

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those ideas on *metaphysical* and *moral* subjects, which may be equally imparted to the blind and the deaf; enabling them to arrive at a knowledge of the same truths, and exciting in their minds the same moral emotions. The *signs* employed in the reasonings of these two classes of persons will of course excite by association, in their respective fancies, very different *material images;* but whence the origin of the metaphysical and moral notions of which these signs are the vehicle, and for suggesting which, *all* sets of signs seem to be equally fitted?"

What are these "*notions,*" expressly referred, not to material, but to metaphysical or moral, objects, which are here clearly distinguished from the "*signs,*" or mere words, that are used to indicate them? As a strict Nominalist, and yet as a vigorous opponent of philosophical skepticism, Stewart would have found it difficult to answer this question. In truth, when we speak of *cause, time, space, substance,* etc., no one but a skeptic can maintain that either mere words, or specific material things, are the objects of our thoughts.

On the other side, we present an extract from the argument of Bishop Berkeley, who is among the ablest and most consistent of the modern Nominalists.

"It is thought that every name hath, or ought to have, one only precise and settled signification, which inclines men to think that there are certain *abstract determinate ideas,* which constitute the true and only immediate signification of each general name; and that it is by the mediation of these abstract ideas, that a general name comes to signify any particular thing. Whereas, in truth, *there is no such thing as one precise and definite signification annexed to any general name,* they all signifying indifferently *a great number of* PARTICULAR *ideas.* . . . . To this it will be objected, that every name that has a definition, is thereby restrained to one certain signification. For example, a triangle is defined to be 'a plain surface comprehended by three right lines.' To which I answer, that in the definition it is not said whether the surface be great or small, black or white, nor whether the sides are long or short, equal or unequal, nor with what angles they are inclined to each other: — in all which there may be great variety, and consequently there is no *one* settled idea which limits the signification of the word *triangle.* It is one thing to keep a name constantly to the same definition, and another to make it stand everywhere for the same idea; the one is necessary, the other useless and impracticable.

"But to give a further account how words came to produce the doctrine of abstract ideas, it must be observed that it is a received opinion, that language has no other end but the communicating our ideas, and that every and the Realists about the existence of universals, I have taken no notice of the intermediate sect called Conceptualists; whose

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significant name stands for an idea. This being so, and it being withal certain that names, which yet are not thought altogether insignificant, do not always mark out particular conceivable ideas, it is straightway concluded that they stand for abstract notions. That there are many names in use amongst speculative men, which do not always suggest to others determinate particular ideas, is what nobody will deny. And a little attention will discover, that it is not necessary (even in the strictest reasonings) significant names which stand for ideas should, every time they are used, excite in the understanding the ideas they are made to stand for; in reading and discoursing, names being, for the most part, used as letters are in algebra, in which, though a particular quantity be marked by each letter, yet, to proceed right, it is not requisite that in every step each letter suggest to your thoughts that particular quantity it was appointed to stand for.

"Besides, the communicating of ideas marked by words is not the chief and only end of language, as is commonly supposed. There are other ends, as the raising of some passion, the exciting to or deterring from an action, the putting the mind in some particular disposition, to which the former is in many cases barely subservient, and sometimes entirely omitted, when these can be obtained without it, as I think doth not unfrequently happen in the familiar use of language. I entreat the reader to reflect with himself, and see if it doth not often happen, either in hearing or reading a discourse, that the passions of fear, love, hatred, admiration, disdain, and the like, arise immediately in his mind upon the perception of certain words, without any ideas coming between. At first, indeed, the words might have occasioned ideas that were fit to produce those emotions; but if I mistake not, it will be found that when language has once grown familiar, the hearing of the sounds or sight of the characters is oft immediately attended with those passions, which at first were wont to be produced by the intervention of ideas that are now quite omitted. May we not, for example, be affected with the promise of a *good thing*, though we have not an idea of what it is? Or is not the being threatened with *danger* sufficient to excite a dread, though we think not of any particular evil likely to befall us, nor yet frame to ourselves an abstract? If any one shall join ever so little reflection of his own to what has been said, I believe it will evidently appear to him, that general names are often used in the propriety of language without the speaker's designing them for marks of ideas of his own, which he would have them raise in the mind of the hearer. Even proper names themselves do not seem always spoken with a design to bring into our view the ideas of those individuals that are supposed to be marked by them. For example, when a schoolman tells me distinguishing tenet is said to have been, that the mind has a power of forming general conceptions. From the indistinctness and inaccuracy of their language on the subject, it is not a very easy matter to ascertain precisely what was their opinion on the point in question; but on the whole, I am inclined to think that it amounted to the two following propositions: *first*, that we have no reason to believe the existence of any essences, or universal ideas, corresponding to general terms; and *secondly*, that the mind has the power of reasoning concerning *genera* or classes of individuals, *without the mediation of language*. Indeed, I cannot think of any other hypothesis which it is possible to form on the subject, distinct from those of the two celebrated sects already mentioned. In denying the existence of univer sals, we know that the Conceptualists agreed with the Nominalists. In what, then, can we suppose that they differed from them, but about the necessity of language as an instrument of thought, in carrying on our general speculations? *

Aristotle hath said it, all I conceive he means by it, is, to dispose me to embrace his opinion with the deference and submission which custom has annexed to that name." — Introduction to the *Principles of Human Knowledge,* §§ XVIII–XX.

* [It is hardly fair to charge the doctrine of the Conceptualists with *obscurity* or *indefiniteness,* whatever may be thought of its foundation in truth. Its meaning is obvious enough. Whenever we use a general term, as *animal, house, triangle,* the Conceptualists maintain that our object of thought is something more definite than a *mere word,* but less definite than such a precise idea as we have of a particular *house* or *triangle;* — it must be thus less definite, inasmuch as it is equally applicable to any house or triangle whatsoever, be it large or small — black, white, or green. They affirm, that this object of thought is *a conception of such properties only as are common to all* triangles, or to all houses. Such a conception, they say, is possible; it is merely a partial consideration of an object. Thus, I may think of *a three-sided figure simply,* without considering what it is made of, or whether it be large or small. On the other hand, the Nominalists maintain that I cannot *think an object,* without thereby *imaging* it to the fancy, and thus individualizing it, or rendering it particular instead of general.

Perhaps both parties are right. *Some* general ideas, (those, namely, *of a low order of generalization,*) may be thought of, without the aid of words. Thus, I may have a very clear conception of a *yellow globe, six inches in*

With this sect of Conceptualists, Dr. Reid is disposed to rank Mr. Locke; and I agree with him so far as to think, that, if Locke had any decided opinion on the point in dispute, it did not differ materially from what I have endeavored to express in the two general propositions which I have just now stated. The apparent inconsistencies which occur in that part of his Essay in which the question is discussed, have led subsequent authors to represent his sentiments in different lights; but as these inconsistencies plainly show, that he was neither satisfied with the system of the Realists, nor with that of the Nominalists, they appear to me to demonstrate, that he leaned to the intermediate hypothesis already mentioned, notwithstanding the inaccurate and paradoxical manner in which he has expressed it.

Dr. Reid's opinion on this subject.—May I take the liberty of adding, that Dr. Reid's own opinion seems to me also to coincide nearly with that of the Conceptualists; or, at least, to coincide with the two propositions which I have already supposed

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diameter, without thinking of it as hard or soft, hot or cold, heavy or light, or as made of plaster, iron, wood, pasteboard, india-rubber, or any other material. So, also, I may think of a star, without thinking of any particular star, as Sirius or Arcturus. On the other hand, it seems very obvious that general terms *of a very high order of generalization,* such as *thing, object, principle,* etc., cannot have any object of thought corresponding to them except mere words; and the only way to apprehend the meaning of such words is to call up in the mind one or more individuals of the class denoted by them, and, in the consideration of these individuals, to limit our attention as far as possible to those qualities only which they possess in common with their class. The Nominalists and Conceptualists would differ from each other only in determining the point on the scale of generalization at which the power of forming general conceptions ends, and the necessity of using words begins; or, what is the same thing, in determining what, and how many, qualities may be abstracted, before the general idea evanesces into a mere word. If all men were of the same size and complexion, I could certainly form the general conception of *a man.* But it is still disputed whether color or size can be abstracted from any class of material objects without destroying the general conception of that class It appears certain that we can form a distinct conception of *breadthless* lines as in geometry.]

to contain a summary of their doctrine? The absurdity of the ancient opinion concerning universals, as maintained both by Plato and Aristotle, he has exposed by the clearest and most decisive arguments; not to mention, that, by his own very original and important speculations concerning the ideal theory, he has completely destroyed that natural prejudice from which the whole system of universal ideas gradually took rise. If, even in the case of individuals, we have no reason to believe the existence of any object of thought in the mind, distinct from the mind itself, we are at once relieved from all the difficulties in which philosophers have involved themselves, by attempting to explain, in consistency with that ancient hypothesis, the process of the mind in its general speculations.

On the other hand, it is no less clear, from Dr. Reid's criticisms on Berkeley and Hume, that his opinion does not coincide with that of the Nominalists; and that the power which the mind possesses of reasoning concerning classes of objects, appears to him to imply some faculty, of which no notice is taken in the systems of these philosophers.

In order to justify his own expressions concerning universals, and in opposition to the language of Berkeley and Hume, Dr. Reid is at pains to illustrate a distinction between conception and imagination, which, he thinks, has not been sufficiently attended to by philosophers. "A universal," says he, "is not an object of any external sense, and therefore cannot be *imagined;* but it may be distinctly *conceived.* When Mr. Pope says, 'The proper study of mankind is man,' I conceive his meaning distinctly; although I neither imagine a black or a white, a crooked or a straight man. I can *conceive* a thing that is impossible; but I cannot distinctly *imagine* a thing that is impossible; I can conceive a proposition or a demonstration, but I cannot imagine either. I can conceive understanding and will, virtue and vice, and other attributes of the mind; but I cannot imagine them. In like manner, I can distinctly conceive universals; but I cannot imagine them."

It appears from this passage, that, *by conceiving universals,* Dr. Reid *means nothing more than understanding the meaning* *of propositions involving general terms.* But the observations he has made, (admitting them in their full extent,) do not in the least affect the question about the necessity of signs, to enable us to speculate about such propositions. The vague use which metaphysical writers have made of the word *conception*, (of which I had occasion to take notice in a former chapter,) has contributed in part to embarrass this subject. That we cannot conceive universals in a way at all analogous to that in which we conceive an absent object of sense, is granted on both sides. Why then should we employ the same word, *conception*, to express two operations of the mind which are essentially different? When we speak of *conceiving* or *understanding* a general proposition, we mean nothing more than that we have a conviction, (founded on our previous use of the words in which it is expressed,) that we have it in our power, at pleasure, to *substitute, instead of the general terms, some one of the individuals comprehended under them.* When we hear a proposition announced, of which the terms are not familiar to us, we naturally desire to have it exemplified, or illustrated, by means of some particular instance; and when we are once satisfied by such an application, that we have the interpretation of the proposition at all times in our power, we make no scruple to say, that we conceive or understand its meaning, although we should not extend our views beyond the words in which it is announced, or even although no particular exemplification of it should occur to us at the moment. It is in this sense only, that the terms of any general proposition can possibly be understood; and therefore Dr. Reid's argument does not, in the least, invalidate the doctrine of the Nominalists, that, without the use of language, (under which term I comprehend every species of signs,) we should never have been able to extend our speculations beyond individuals.

That in many cases, we may safely employ in our reasonings general terms, the meaning of which we are not even able to interpret in this way, and consequently, which are to us wholly insignificant, I had occasion already to demonstrate, in a former part of this section.

IV. *Inferences with respect to the use of language as an instrument of thought, and the errors in reasoning to which it occasionally gives rise.* — In the last section, I mentioned Dr. Campbell as an ingenious defender of the system of the Nominalists; and I alluded to a particular application which he has made of their doctrine. The reasonings which I had then in view, are to be found in the seventh chapter of the second book of his Philosophy of Rhetoric; in which chapter, he proposes to explain how it happens, "that nonsense so often escapes being detected, both by the writer and the reader." The title is somewhat ludicrous in a grave and philosophical work; but the disquisition to which it is prefixed contains many acute and profound remarks on the nature and power of signs, both as a medium of communication, and as an instrument of thought.

Dr. Campbell's speculations with respect to language as an instrument of thought, seem to have been suggested by the following passage in Mr. Hume's Treatise of Human Nature. "I believe, every one who examines the situation of his mind in reasoning will agree with me, that we do not annex distinct and complete ideas to every term we make use of; and that in talking of *government*, *church*, *negotiation*, *conquest*, we seldom spread out in our minds all the simple ideas of which these complex ones are composed. It is, however, observable, that notwithstanding this imperfection, we may avoid talking nonsense on these subjects; and may perceive any repugnance among the ideas, as well as if we had a full comprehension of them. Thus if, instead of saying, that, in war, the weaker have always recourse to *negotiation*, we should say, that they have always recourse to *conquest;* the custom which we have acquired, of attributing certain relations to ideas, still follows the words, and makes us immediately perceive the absurdity of that proposition."

How we can use words with propriety, though without attaching any particular idea or signification to them. — In the remarks which Dr. Campbell has made on this passage, he has endeavored to explain in what manner our habits of thinking and speaking gradually establish in the mind such relations among the words we employ, as enable us to carry on processes of reasoning by means of them, without attending in every instance to their particular signification. With most of his remarks on this subject I perfectly agree; but the illustrations he gives of them, are of too great extent to be introduced here; and I would not wish to run the risk of impairing their perspicuity, by attempting to abridge them. I must, therefore, refer such of my readers as wish to prosecute the speculation, to his very ingenious and philosophical treatise.

"In consequence of these circumstances," says Dr. Campbell, "it happens that, in matters which are perfectly familiar to us, we are able to reason by means of words, without examining, in every instance, their signification. Almost all the possible applications of the terms (in other words, all the acquired relations of the signs,) have become *customary* to us. The consequence is, that an *unusual application of any term is instantly detected;* this detection breeds doubt, and this doubt occasions an immediate recourse to ideas. The recourse of the mind, when in any degree puzzled with the signs, to the knowledge it has of the things signified, is natural, and of such subjects perfectly easy. And on this recourse, the discovery of the meaning, or of the unmeaningness, of what is said, is the immediate effect. But in matters that are by no means familiar, or are treated in an uncommon manner, and in such as are of an abstruse and intricate nature, the case is widely different." The instances in which we are chiefly liable to be imposed on by words without meaning are, (according to Dr. Campbell,) the three following: —

First, Where there is an exuberance of metaphor.

Secondly, When the terms most frequently occurring denote things which are of a complicated nature, and to which the mind is not sufficiently familiarized. Such are the words, *government, church, state, constitution, polity, power, commerce, legislature, jurisdiction, proportion, symmetry, elegance.*

Thirdly, When the terms employed are very *abstract,* and consequently of very *extensive signification.** For an illustration of these remarks, I must refer the reader to the ingenious work which I just now quoted.

To the observations of these eminent writers, I shall take the liberty of adding, that we are doubly liable to the mistakes they mention, when we make use of a language which is not perfectly familiar to us. Nothing, indeed, I apprehend, can show more clearly the use we make of words in reasoning than this, that an observation which, when expressed in our own language, seems trite or frivolous, often acquires the appearance of depth and originality, by being translated into another. For my own part, at least, I am conscious of having been frequently led, in this way, to form an exaggerated idea of the merits of ancient and of foreign authors; and it has happened to me more than once, that a sentence, which seemed at first to contain something highly ingenious and profound, when translated into words familiar to me, appeared obviously to be a trite or a nugatory proposition.

The effect produced by an artificial and inverted style in our own language, is similar to what we experience when we read a composition in a foreign one. The eye is too much dazzled to see distinctly.

The deranged collocation of the words in Latin composition, aids powerfully the imposition we have now been considering, and renders that language an inconvenient medium of philosophical communication, as well as an inconvenient instrument of accurate thought. Indeed, in all languages in which this latitude in the arrangement of words is admitted, the associations among words must be looser than where one invariable order is followed; and of consequence, on the principles of Hume and Campbell, the mistakes which are committed in reasonings expressed in such languages will not be so readily detected.

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* "The more general any word is in its signification, it is the more liable to be abused by an improper and unmeaning application. A very general term is applicable alike to a multitude of different individuals, a particular term is applicable but to a few. When the rightful applications of a word are extremely numerous, they cannot all be so strongly fixed by habit, but, that, for greater security, we must perpetually recur in our minds from the sign to the notion we have of the thing signified; and, for the reason aforementioned, it is in such instances difficult precisely to ascertain this notion. Thus, the latitude of a word, though different from its ambiguity, hath often a similar effect."—Philosophy of Rhetoric, vol. ii. p. 122.

Languages, being controlled by popular use, are not adapted for scientific purposes. — The errors in reasoning to which we are exposed, in consequence of the use of words as an instrument of thought, will appear the less surprising, when we consider that all the languages which have hitherto existed in the world, have derived their origin from popular use; and that their application to philosophical purposes was altogether out of the view of those men who first employed them. Whether it might not be possible to invent a language which would at once facilitate philosophical communication, and form a more convenient instrument of reasoning and of invention than those we possess at present, is a question of very difficult discussion, and upon which I shall not presume to offer an opinion. The failure of Wilkins's very ingenious attempt towards a *real character* and a philosophical language, is not perhaps decisive against such a project; for not to mention some radical defects in his plan, the views of that very eminent philosopher do not seem to have extended much further than to promote and extend the literary intercourse among different nations. Leibnitz, so far as I know, is the only author who has hitherto conceived the possibility of aiding the powers of invention and of reasoning, by the use of a more convenient instrument of thought: but he has nowhere explained his ideas on this very interesting subject. It is only from a conversation of his with Mr. Boyle and Mr. Oldenburgh, when he was in England, in 1673, and from some imperfect hints in different parts of his works, that we find it had engaged his attention. In the course of this conversation, he observed, that Wilkins had mistaken the true end of a *real character*, which was not merely to enable different nations to correspond easily together, but *to assist the reason, the invention, and the memory.* In his writings, too, he somewhere speaks of an alphabet of human thoughts, which he had been employed in forming, and which, probably, (as Fontenelle has remarked,) had some relation to his universal language.

The new nomenclature which has been introduced into chemistry, seems to me to furnish a striking illustration of the effect of appropriate and well defined expressions, in aiding the intellectual powers; and the period is probably not far distant, when similar innovations will be attempted in some of the other sciences.

V. *Of the purposes to which the powers of Abstraction and Generalization are subservient.* — It has been already shown, that, without the use of signs, all our knowledge must necessarily have been limited to individuals, and that we should have been perfectly incapable both of classification and general reasoning. Some authors have maintained, that without the power of generalization, (which, I have endeavored to show, means nothing more than the capacity of employing general terms,) it would have been impossible for us to have carried on any species of reasoning whatever. But I cannot help thinking that this opinion is erroneous; or, at least, that it is very imperfectly stated. The truth is, it appears to me to be just in one sense of the word *reasoning*, but false in another; and I even suspect it is false in that sense of the word in which it is most commonly employed. Before, therefore, it is laid down as a general proposition, the meaning we are to annex to this very vague and ambiguous term, should be ascertained with precision.

One kind of reasoning can be carried on without generalization, and without language. — It has been remarked by several writers, that *the expectation* which we feel *of the continuance of the laws of nature*, is not founded upon reasoning; and different theories have of late been proposed to account for its origin. Mr. Hume resolves it into the association of ideas. Dr. Reid, on the other hand, maintains, that it is an original principle of our constitution, which does not admit of any explanation; and which, therefore, is to be ranked among those general and ultimate facts, beyond which philosophy is unable to proceed. Without this principle of expectation, it would be impossible for us to accommodate our conduct to the established course of nature; and, accordingly, we find that it is a principle coeval with our very existence, and, in some measure, common to man with the lower animals.

It is an obvious consequence of this doctrine, that, although philosophers be accustomed to state what are commonly called the laws of nature in the form of general propositions, it is by no means necessary for the practical purposes of life, that we should express them in this manner, or even that we should express them in words at all. The philosopher, for example, may state it as a law of nature, that "fire scorches;" or that "heavy bodies, when unsupported, fall downwards;" but long before the use of artificial signs, and even before the dawn of reason, a child learns to act upon both of these suppositions. In doing so, it is influenced merely by the instinctive principle which has now been mentioned, directed in its operation (as is the case with many other instincts) by the experience of the individual. If man, therefore, had been destined for no other purposes than to acquire such an acquaintance with the course of nature as is necessary for the preservation of his animal existence, he might have fulfilled all the ends of his being without the use of language.

As we are enabled, by our instinctive anticipation of physical events, to accommodate our conduct to what we foresee is to happen, so we are enabled, in many cases, to increase our power, by employing physical causes as instruments for the accomplishment of our purposes; nay, we can employ a series of such causes, so as to accomplish very remote effects. We can employ the agency of air, to increase the heat of a furnace; the furnace, to render iron malleable; and the iron, to all the various purposes of the mechanical arts. Now it appears to me, that all this may be conceived and done without the aid of language; and yet, assuredly, to discover a series of means subservient to a particular end, or, in other words, an effort of mechanical invention, implies, according to the common doctrines of philosophers, the exercise of our reasoning powers. In this sense, therefore, of the word reasoning, I am inclined to think, that it is not essentially connected with the faculty of generalization, or with the use of signs.

It is some confirmation of this conclusion, that savages, whose minds are almost wholly occupied with particulars, and who have neither inclination nor capacity for general speculations, are yet occasionally observed to employ a long train of means for accomplishing a particular purpose. Even something of this kind, but in a very inferior degree, may, I think, be remarked in the other animals; and that they do not carry it further, is probably not the effect of their want of generalization, but of the imperfection of some of those faculties which are common to them with our species; particularly of their powers of attention and recollection. The instances which are commonly produced, to prove that they are not destitute of the power of reasoning, are all examples of that species of contrivance which has been mentioned; and are perfectly distinct from those intellectual processes to which the use of signs is essentially subservient.*

As a further confirmation of the same doctrine, it may be remarked, that there is no class of speculative men who are in general so much at a loss to convey their ideas as men of mechanical invention. This, I think, can only arise from their being accustomed to direct their attention *immediately* to the subjects of their consideration, without the use of signs. Philosophers who speculate on questions which require the employment of words as an instrument of thought, are seldom deficient in a facility of expression.

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* One of the best attested instances which I have met with, of sagacity in the lower animals, is mentioned by M. Bailly, in his "Lettre sur les Animaux," addressed to M. Le Roy: —

["One of my friends, an intelligent and trustworthy man, related to me two facts of which he was an eye-witness. He had a very sagacious monkey, and was wont to amuse himself by giving it nuts, which it was very fond of; but he placed them so far off, that the monkey, being held back by its chain, could not reach them. After many unsuccessful efforts, which served only to sharpen its invention, the monkey, seeing a servant pass by with a napkin under his arm, caught the napkin from him, and made use of it to brush the nut within reach. The mode of cracking the nut required a new invention; the monkey succeeded by placing the nut on the ground, and letting a stone fall on it from above, so as to break it. You see, Sir, that without knowing as well as Galileo the laws of falling bodies, the monkey had observed the force which these bodies acquire by falling. But it once happened that this expedient failed. One rainy day, the ground was soft, and the nut sunk into it without breaking. What did the monkey do? He found a piece of tile, on which he placed the nut, and then the fall of the stone broke it, without driving it into the ground."

Whether that particular species of mechanical contrivance which has now been mentioned, and which consists merely in employing a series of physical causes to accomplish an effect which we cannot produce immediately, should or should not be dignified with the name of reasoning, I shall not now inquire. It is sufficient for my present purpose to remark, that it is essentially different from those intellectual processes to which the use of signs is indispensably necessary. At the same time, I am ready to acknowledge, that what I have now said, is not strictly applicable to those more complicated mechanical inventions, in which a variety of powers are made to conspire at once to produce a particular effect. Such contrivances, perhaps, may be found to involve processes of the mind which cannot be carried on without signs. But these questions will fall more properly under our consideration when we enter on the subject of reasoning.

When words are necessary to thought. — In general, it may be remarked, that in so far as our thoughts relate merely to individual objects, or to individual events, which we have actually

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(We need not question the good faith of the reporter of this anecdote. The only doubt is, whether the animal had not previously, without his knowledge, been taught how to use these expedients.)]

But admitting the facts to be accurately stated, they will still leave an essential distinction between man and brutes; for in none of the contrivances here mentioned, is there any thing analogous to those intellectual processes which lead the mind to general conclusions, and which (according to the foregoing doctrine) imply the use of general terms. Those powers, therefore, which enable us to classify objects, and to employ signs as an instrument of thought, are, as far as we can judge, peculiar to the human species.

perceived, and of which we retain a distinct remembrance,* we are not under the necessity of employing words. It frequently, however, happens, that when the subjects of our consideration are particular, our reasoning with respect to them may involve very general notions; and, in such cases, although we may conceive, without the use of words, the things about which we reason, yet we must necessarily have recourse to language in carrying on our speculations concerning them. If the *subjects* of our reasonings be general, (under which description I include all our reasonings, whether more or less comprehensive, which do not relate merely to individuals,) words are the sole objects about which our thoughts are employed. According as these words are comprehensive or limited in their signification, the conclusions we form will be more or less general; but this accidental circumstance does not in the least affect the nature of the intellectual process; so that it may be laid down as a proposition which holds without any exception, that in every case in which we extend our speculations beyond individuals, language is not only a useful auxiliary, but is the sole instrument by which they are carried on.

Difference between the speculations of the philosopher and of the

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* I have thought it proper to add this limitation of the general proposition, because individual objects, and individual events, which have not fallen under the examination of our senses, cannot possibly be made the subject of our consideration but by means of language. The manner in which we think of such objects and events, is accurately described in the following passage of Wollaston; however unphilosophical the conclusion may be which he deduces from his reasoning.

"A man is not known ever the more to posterity, because his name is transmitted to them; he doth not live, because his name does. When it is said, Julius Cæsar subdued Gaul, beat Pompey, changed the commonwealth into a monarchy, etc., it is the same thing as to say the conqueror of Pompey was Cæsar; that is, Cæsar, and the conqueror of Pompey, are the same thing; and Cæsar is as much known by the one distinction as the other. The amount is only this: that the conqueror of Pompey conquered Pompey; or somebody conquered Pompey; or rather, since Pompey is as little known now as Cæsar, somebody conquered somebody. Such a poor business is this boasted immortality; and such, as has been here described, is the thing called glory among us!"

vulgar. — These remarks naturally lead me to take notice of what forms the characteristical distinction between the speculations of the philosopher and of the vulgar. It is not, that the former is accustomed to carry on his processes of reasoning to a greater extent than the latter; but that the conclusions he is accustomed to form, are far more comprehensive, in consequence of the habitual employment of more comprehensive terms. Among the most unenlightened of mankind, we often meet with individuals who possess the reasoning faculty in a very eminent degree; but as this faculty is employed merely about particulars, it never can conduct them to general truths; and, of consequence, whether their pursuits in life lead them to speculation or to action, it can only fit them for distinguishing themselves in some very limited and subordinate sphere. The philosopher, whose mind has been familiarized by education, and by his own reflections, to the correct use of more comprehensive terms, is enabled, without perhaps a greater degree of intellectual exertion than is necessary for managing the details of ordinary business, to arrive at general theorems; which, when illustrated to the lower classes of men, in their particular applications, seem to indicate a fertility of invention little short of supernatural.*

The analogy of the algebraical art may be of use in illustrating these observations. The difference, in fact, between the investigations we carry on by its assistance, and other processes of reasoning, is more inconsiderable than is commonly imagined; and, if I am not mistaken, amounts only to this, that the former are expressed in an appropriated language, with which we are not accustomed to associate particular notions. Hence they exhibit the efficacy of signs as an instrument of thought in a more distinct and palpable manner, than the speculations we carry on by words, which are continually awakening the power of conception.

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* "General reasonings seem intricate merely because they are general; nor is it easy for the bulk of mankind to distinguish, in a great number of particulars, that common circumstance in which they all agree, or to extract it pure and unmixt, from the other superfluous circumstances. Every judgment or conclusion with them is particular. They cannot enlarge their view to those universal propositions, which comprehend under them an infinite number of individuals, and include a whole science in a single theorem. Their eye is confounded with such an extensive prospect; and the conclusions derived from it, even though clearly expressed, seem intricate and obscure." — Hume's Political Discourses.

When the celebrated Vieta showed algebraists, that, by substituting in their investigations letters of the alphabet, instead of known quantities, they might render the solution of every problem subservient to the discovery of a general truth, he did not increase the difficulty of algebraical reasonings: he only enlarged the signification of the terms of which they were expressed. And if, in teaching that science, it is found expedient to accustom students to solve problems by means of the particular numbers which are given, before they are made acquainted with *literal* or specious arithmetic, it is not because the former processes are less intricate than the latter, but because their scope and utility are more obvious, and because it is more easy to illustrate, by example than by words, the difference between a particular conclusion and a general theorem.

The difference between the intellectual processes of the vulgar and of the philosopher, is perfectly analogous to that between the two states of the algebraical art before and after the time of Vieta; the general terms which are used in the various sciences, giving to those who can employ them with correctness and dexterity, the same sort of advantage over the uncultivated sagacity of the bulk of mankind, which the expert algebraist possesses over the arithmetical accountant.

The utility of language.—If the foregoing doctrine be admitted as just, it exhibits a view of the utility of language, which appears to me to be peculiarly striking and beautiful; as it shows that the same faculties which, without the use of signs, must necessarily have been limited to the consideration of individual objects and particular events, are, by means of signs, fitted to embrace, without effort, those comprehensive theorems, to the discovery of which, in detail, the united efforts of the whole human race would have been unequal. The advantage our animal strength acquires by the use of mechanical engines, exhibits but a faint image of that increase of our intellectual capacity which we owe to language. It is this increase of our natural powers of comprehension, which seems to be the principal foundation of the pleasure we receive from the discovery of general theorems. Such a discovery gives us at once the command of an infinite variety of particular truths, and communicates to the mind a sentiment of its own power, not unlike to what we feel when we contemplate the magnitude of those physical effects, of which we have acquired the command by our mechanical contrivances.

It may perhaps appear, at first, to be a further consequence of the principles I have been endeavoring to establish, that the difficulty of philosophical discoveries is much less than is commonly imagined; but the truth is, it only follows from them, that this difficulty is of a different nature from what we are apt to suppose, on a superficial view of the subject. To employ, with skill, the very delicate instrument which nature has made essentially subservient to general reasoning, and to guard against the errors which result from an injudicious use of it, require an uncommon capacity of patient attention, and a cautious circumspection in conducting our various intellectual processes, which can only be acquired by early habits of philosophical reflection. To assist and direct us in making this acquisition ought to form the most important branch of a rational logic; a science of far more extensive utility, and of which the principles lie much deeper in the philosophy of the human mind, than the trifling art which is commonly dignified with that name. The branch in particular to which the foregoing observations more immediately relate, must for ever remain in its infancy, till a most difficult and important desideratum in the history of the mind is supplied, by an explanation of the gradual steps by which it acquires the use of the various classes of words which compose the language of a cultivated and enlightened people. Of some of the errors of reasoning to which we are exposed by an incautious use of words, I took notice in the preceding section; and I shall have occasion afterwards to treat the same subject more in detail in a subsequent part of my work.

VI. *Of the errors to which we are liable in speculation, and in the conduct of affairs, in consequence of a rash application of general principles.* — It appears sufficiently from the reasonings which I offered in the preceding section, how important are the advantages which the philosopher acquires, by quitting the study of particulars, and directing his attention to general principles. I flatter myself it appears further, from the same reasonings, that it is in consequence of the use of language alone that the human mind is rendered capable of these comprehensive speculations.

In order, however, to proceed with safety in the use of general principles, much caution and address are necessary, both in establishing their truth, and in applying them to practice. Without a proper attention to the circumstances by which their application to particular cases must be modified, they will be a perpetual source of mistake and of disappointment, in the conduct of affairs, however rigidly just they may be in themselves, and however accurately we may reason from them. If our general principles happen to be false, they will involve us in errors, not only of conduct but of speculation; and our errors will be the more numerous, the more comprehensive the principles are on which we proceed.

To illustrate these observations fully, would lead to a minuteness of disquisition inconsistent with my general plan: and I shall therefore, at present, confine myself to such remarks as appear to be of most essential importance.

Mistakes of the ancients respecting the study of universals. — And, in the first place, it is evidently impossible to establish solid general principles, without the previous study of particulars: in other words, it is necessary to begin with the examination of individual objects, and individual events, in order to lay a groundwork for accurate classification, and for a just investigation of the laws of nature. It is in this way only that we can expect to arrive at general principles, which may be safely relied on, as guides to the knowledge of particular truths:

and unless our principles admit of such a practical application, however beautiful they may appear to be in theory, they are of far less value than the limited acquisitions of the vulgar. The truth of these remarks is now so universally admitted, and is indeed so obvious in itself, that it would be superfluous to multiply words in supporting them; and I should scarcely have thought of stating them in this chapter, if some of the most celebrated philosophers of antiquity had not been led to dispute them, in consequence of the mistaken opinions which they entertained concerning the nature of universals. Forgetting that *genera* and *species* are mere arbitrary creations, which the human mind forms by withdrawing the attention from the distinguishing qualities of objects, and giving a common name to their resembling qualities, they conceive *universals* to be *real existences*, or (as they expressed it) to be *the essences* of individuals; and flattered themselves with the belief, that by directing their attention to these essences in the first instance, they might be enabled to penetrate the secrets of the universe, without submitting to the study of nature in detail. These errors, which were common to the Platonists and the Peripatetics, and which both of them seem to have adopted from the Pythagorean school, contributed, perhaps more than any thing else, to retard the progress of the ancients in physical knowledge. The late learned Mr. Harris is almost the only author of the present age who has ventured to defend this plan of philosophizing, in opposition to that which has been so successfully followed by the disciples of Lord Bacon.

"The Platonists," says he, "considering science as something ascertained, definite, and steady, would admit nothing to be its object which was vague, indefinite, and passing. For this reason, they excluded all individuals or objects of sense, and (as Amonius expresses it) raised themselves in their contemplations from beings particular to beings universal, and which, from their own nature, were eternal and definite." "Consonant to this was the advice of Plato, with respect to the progress of our speculations and inquiries, to descend from those higher genera, which include many subordinate species, down to the lowest rank of species, those which include only individuals. But here it was his opinion, that our inquiries should stop, and, as to individuals, let them wholly alone; because of these there could not possibly be any science."

"Such," continues this author, "was the method of ancient philosophy. The fashion, at present, appears to be somewhat altered, and the business of philosophers to be little else than the collecting from every quarter, into voluminous records, an infinite number of sensible, particular, and unconnected facts, the chief effect of which is to excite our admiration." In another part of his works, the same author observes, that "the mind, truly wise, quitting the study of particulars, as knowing their multitude to be infinite and incomprehensible, turns its intellectual eye to what is general and comprehensive, and, through generals, learns to see and recognize whatever exists."

If we abstract from these obvious errors of the ancient philosophers, with respect to the proper order to be observed in our inquiries, and only suppose them to end where the Platonists said that they should begin, the magnificent encomiums they bestowed on the utility of those comprehensive truths which form the object of science, (making allowance for the obscure and mysterious terms in which they expressed them,) can scarcely be regarded as extravagant. It is probable that, from a few accidental instances of successful investigation, they had been struck with the wonderful effect of general principles in increasing the intellectual power of the human mind; and, misled by that impatience in the study of particulars, which is so often connected with the consciousness of superior ability, they labored to persuade themselves, that, by a life devoted to abstract meditation, such principles might be rendered as immediate objects of intellectual perception, as the individuals which compose the material world are of our external senses. By connecting this opinion with their other doctrines concerning universals, they were unfortunately enabled to exhibit it in so mysterious a form, as not only to impose on themselves, but to perplex the understanding of all the learned in Europe for a long succession of ages.

The progress of human knowledge from particulars to universals. — The conclusion to which we are led by the foregoing observations is, that the foundation of all human knowledge must be laid in the examination of particular objects and particular facts; and that it is only as far as our general principles are resolvable into these primary elements, that they possess either truth or utility. It must not, however, be understood to be implied in this conclusion, that all our knowledge must ultimately rest on our own proper experience. If this were the case, the progress of science, and the progress of human improvement, must have been wonderfully retarded; for, if it had been necessary for each individual to form a classification of objects, in consequence of observations and abstractions of his own, and to infer from the actual examination of particular facts, the general truths on which his conduct proceeds; human affairs would at this day remain nearly in the same state to which they were brought by the experience of the first generation. In fact, this is very nearly the situation of the species in all those parts of the world, in which the existence of the race depends on the separate efforts which each individual makes, in procuring for himself the necessaries of life; and in which, of consequence, the habits and acquirements of each individual must be the result of his own personal experience. In a cultivated society, one of the first acquisitions which children make, is the use of language; by which means they are familiarized, from their earliest years, to the consideration of classes of objects, and of general truths; and before that time of life at which the savage is possessed of the knowledge necessary for his own preservation, are enabled to appropriate to themselves the accumulated discoveries of ages.

Notwithstanding, however, the stationary condition in which the race must, of necessity, continue, prior to the separation of arts and professions, the natural disposition of the mind to ascend from particular truths to general conclusions, could not fail to lead individuals, even in the rudest state of society, to collect the results of their experience, for their own instruction and that of others. But, without the use of general terms, the only possible way of communicating such conclusions, would be by means of some particular example, of which the general application was striking and obvious. In other words, the wisdom of such ages will necessarily be expressed in the form of fables or parables, or in the still simpler form of proverbial instances; and not in the scientific form of general maxims. In this way, undoubtedly, much useful instruction, both of a prudential and moral kind, might be conveyed: at the same time, it is obvious, that while general truths continue to be expressed merely by particular exemplifications, they would afford little or no opportunity to one generation to improve on the speculations of another; as no effort of the understanding could combine them together, or employ them as premises, in order to obtain other conclusions more remote and comprehensive. For this purpose, it is absolutely necessary, that the scope or moral of the fable should be separated entirely from its accessory circumstances, and stated in the form of a general proposition.

Probable intellectual improvement of future ages. — From what has now been said, it appears how much the progress of human reason, which necessarily accompanies the progress of society, is owing to the introduction of general terms, and to the use of general propositions. In consequence of the gradual improvements which take place in language as an instrument of thought, the classifications both of things and facts, with which the infant faculties of each successive race are conversant, are more just and more comprehensive than those of their predecessors: the discoveries which, in one age, were confined to the studious and enlightened few, becoming in the next the established creed of the learned; and in the third, forming part of the elementary principles of education. Indeed, among those who enjoy the advantages of early instruction, some of the most remote and wonderful conclusions of the human intellect are, even in infancy, as completely familiarized to the mind, as the most obvious phenomena which the material world exhibits to their senses.

If these remarks be just, they open an unbounded prospect of intellectual improvement to future ages; as they point out a provision made by nature to facilitate and abridge, more and more, the process of study, in proportion as the truths to be acquired increase in number. Nor is this prospect derived from theory alone. It is encouraged by the past history of all the sciences; in a more particular manner, by that of mathematics and physics, in which the state of discovery, and the prevailing methods of instruction, may, at all times, be easily compared together. In this last observation I have been anticipated by a late eminent mathematician, whose eloquent and philosophical statement of the argument cannot fail to carry conviction to those who are qualified to judge of the facts on which his conclusion is founded.

"To such of my readers as may be slow in admitting the possibility of this progressive improvement in the human race, allow me to state, as an example, the history of that science in which the advances of discovery are the most certain, and in which they may be measured with the greatest precision. Those elementary truths of geometry and of astronomy, which, in India and Egypt, formed an occult science, upon which an ambitious priesthood founded its influence, were become, in times of Archimedes and Hipparchus, the subjects of common education in the public schools of Greece. In the last century, a few years of study were sufficient for comprehending all that Archimedes and Hipparchus knew; and, at present, two years employed under an able teacher, carry the student beyond those conclusions which limited the inquiries of Leibnitz and of Newton. Let any person reflect on these facts, let him follow the immense chain which connects the inquiries of Euler with those of a priest of Memphis; let him observe at each epoch, how genius outstrips the present age, and how it is overtaken by mediocrity in the next; he will perceive, that nature has furnished us with the means of abridging and facilitating our intellectual labor, and that there is no reason for apprehending that such simplifications can ever have an end. He will perceive, that at the moment when a multitude of particular solutions, and of insulated facts, begin to distract the attention, and to overcharge the memory, the former gradually lose themselves in one general method, and the latter unite in one general law: and that these generalizations continually succeeding one to another, like the successive multiplications of a number by itself, have no other limit, than that infinity which the human faculties are unable to comprehend."

VII. *Differences in the intellectual characters of individuals arising from their different habits of abstraction and generalization.* — In mentioning as one of the principal effects of civilization, its tendency to familiarize the mind to general terms and to general propositions, I did not mean to say, that this influence extends equally to all the classes of men in society. On the contrary, it is evidently confined, in a great measure, to those who receive a liberal education; while the minds of the lower orders, like those of savages, are so habitually occupied about particular objects and particular events, that, although they are sometimes led from imitation, to employ general expressions, the use which they make of them is much more the result of memory than judgment; and it is but seldom that they are able to comprehend fully any process of reasoning in which they are involved.

It is hardly necessary for me to remark, that this observation with respect to the incapacity of the vulgar for general speculations, (like all observations of a similar nature,) must be received with some restrictions. In such a state of society as that in which we live, there is hardly any individual to be found to whom some general terms, and some general truths, are not perfectly familiar; and, therefore, the foregoing conclusions are to be considered as descriptive of those habits of thought alone, which are most prevalent in their mind. To abridge the labor of reasoning and of memory, by directing the attention to general principles, instead of particular truths, is the professed aim of all philosophy; and according as individuals have more or less of the philosophic spirit, their habitual speculations (whatever the nature of their pursuits may be) will relate to the former, or to the latter, of these objects.

The differences between practical men and philosophers. — There are, therefore, among the men who are accustomed to the exercise of their intellectual powers, two classes, whose habits of thought are remarkably distinguished from each other; the one class comprehending what we commonly call *men of business*, or, more properly, *men of detail;* the other, *men of abstraction;* or, in other words, *philosophers.*

The advantages which, in certain respects, the latter of these possess over the former, have been already pointed out; but it must not be supposed, that these advantages are always purchased without some inconvenience. As the solidity of our general principles depends on the accuracy of the particular observations into which they are ultimately resolvable, so their utility is to be estimated by the practical applications of which they admit; and it unfortunately happens, that *the same turn of mind which is favorable to philosophical pursuits,* unless it be kept under proper regulation, *is extremely apt to disqualify us for applying our knowledge to use, in the exercise of the arts and in the conduct of affairs.*

The danger of applying abstract principles incautiously. — In order to perceive the truth of these remarks, it is almost sufficient to recollect, that as classifications, and, of consequence, general reasoning, presupposes the exercise of abstraction; a natural disposition to indulge in them, cannot fail to lead the mind to *overlook the specific differences of things,* in attending to their common qualities. To succeed, however, in practice, a familiar and circumstantial acquaintance with the particular objects which fall under our observation, is indispensably necessary.

But further: As all general principles are founded on classifications which imply the exercise of abstraction, it is necessary to regard them, in their practical applications, merely as approximations to the truth; the defects of which must be supplied by habits acquired by personal experience. In considering, for example, the theory of the mechanical powers; it is usual to simplify the objects of our conception, by abstracting from friction, and from the weight of the different parts of which they are composed. Levers are considered as mathematical lines, perfectly inflexible; and ropes, as mathematical lines, perfectly flexible;—and by means of these, and similar abstractions, a subject, which is in itself extremely complicated, is brought within the reach of elementary geometry. In the theory of politics, we find it necessary to abstract from many of the peculiarities which distinguish different forms of government from each other, and to reduce them to certain general classes, according to their prevailing tendency. Although all the governments we have ever seen, have had more or less of mixture in their composition, we reason concerning pure monarchies, pure aristocracies, and pure democracies, as if there really existed political establishments corresponding to our definitions. Without such a classification, it would be impossible for us to fix our attention, amidst the multiplicity of particulars which the subject presents to us, or to arrive at any general principles, which might serve to guide our inquiries in comparing different institutions together.

It is for a similar reason, that the speculative farmer reduces the infinite variety of soils to a few general descriptions; the physician, the infinite variety of bodily constitutions to a few temperaments; and the moralist, the infinite variety of human characters to a few of the ruling principles of action.

Notwithstanding, however, the obvious advantages we derive from these classifications, and the general conclusions to which they lead, it is evidently impossible that principles, which derived their origin from efforts of abstraction, should apply literally to practice; or, indeed, that they should afford us any considerable assistance in conduct, without a certain degree of practical and experimental skill. Hence it is, that the mere theorist so frequently exposes himself, in real life, to the ridicule of men whom he despises, and, in the general estimation of the world, falls below the level of the common drudges in business and the arts. The walk, indeed, of these unenlightened practitioners, must necessarily be limited by their accidental opportunities of experience; but, so far as they go, they operate with facility and success, while the merely speculative philosopher, although possessed of principles which enable him to approximate to the truth in an infinite variety of untried cases, and although he sees with pity the narrow views of the multitude, and the ludicrous pretensions with which they frequently oppose their trifling successes to his theoretical speculations, finds himself perfectly at a loss when he is called upon, by the simplest occurrences of ordinary life, to carry his principles into execution. Hence the origin of that maxim "which," as Hume remarks, "has been so industriously propagated by the dunces of every age, that a man of genius is unfit for business."

What practical skill consists in. — In what consists practical or experimental skill, it is not easy to explain completely; but among other things, it obviously implies a talent for minute and comprehensive and rapid observation; a memory at once retentive and ready, in order to present to us accurately, and without reflection, our theoretical knowledge; a presence of mind not to be disconcerted by unexpected occurrences, and, in some cases, an uncommon degree of perfection in the external senses, and in the mechanical capacities of the body. All these elements of practical skill, it is obvious, are to be acquired only by habits of active exertion, and by a familiar acquaintance with real occurrences; for as all the practical principles of our nature, both intellectual and animal, have a reference to particulars, and not to generals, so it is in the active scenes of life alone, and amidst the details of business, that they can be cultivated and improved.

Experience and practical skill not sufficient for all occasions. — The remarks which have been already made are sufficient to illustrate the impossibility of acquiring talent for business, or for any of the practical arts of life, without actual experience. They show, also, that mere experience, without theory, may qualify a man, in certain cases, for distinguishing himself in in both. It is not, however, to be imagined that, in this way, individuals are to be formed for the uncommon, or for the important situations of society, or even for enriching the arts by new inventions; for as their address and dexterity are founded entirely on imitation, or derived from the lessons which experience has suggested to them, they cannot possibly extend to new combinations of circumstances. Mere experience, therefore, can, at best, prepare the mind for the subordinate departments of life, for conducting the established routine of business, or for a servile repetition in the arts of common operations.

In the character of Mr. George Grenville, which Mr. Burke introduced in his celebrated speech on American Taxation, a lively picture is drawn of the insufficiency of mere experience to qualify a man for new and untried situations in the administration of government. The observations he makes on this subject are expressed with his usual beauty and felicity of language, and are of so general a nature, that, with some trifling alterations, they may be extended to all the practical pursuits of life.

" Mr. Grenville was bred to the law, which is, in my opinion, one of the finest and noblest of human sciences; a science which does more to quicken and invigorate the understanding, than all the other kinds of learning put together ; but it is not apt, except in persons very happily born, to open and to liberalize the mind exactly in the same proportion. Passing from that study, he did not go very largely into the world, but plunged into business, I mean into the business of office, and the limited and fixed methods and forms established there. Much knowledge is to be had, undoubtedly, in that line, and there is no knowledge which is not valuable. But it may be truly said, that men too much conversant in office are rarely minds of remarkable enlargement. Their habits of office are apt to give them a turn to think the substance of business not to be much more important than the forms in which it is conducted. These forms are adapted to ordinary occasions; and, therefore, persons who are nurtured in office do admirably well, as long as things go on in their common order; but when the high roads are broken up, and the waters out, when a new and troubled scene is opened, and the file affords no precedent, then it is, that a greater knowledge of mankind, and a far more extensive comprehension of things is requisite, than ever office gave, or than office can ever give."

Nor is it in new combinations of circumstances alone, that general principles assist us in the conduct of affairs; they render the application of our practical skill more unerring and more perfect. For as general principles limit the utility of practical skill to supply the imperfections of theory, they diminish the number of cases in which this skill is to be employed, and thus at once facilitate its improvement wherever it is requisite, and lessen the errors to which it is liable, by contracting the field within which it is possible to commit them.

It would appear, then, that there are two opposite extremes into which men are apt to fall, in preparing themselves for the duties of active life. The one rises from habits of abstraction and generalization carried to an excess; the other, from a minute, an exclusive, and an unenlightened attention to the objects and events which happen to fall under their actual experience.

A good education would guard against both extremes. — In a perfect system of education, care should be taken to guard against both extremes, and to unite habits of abstraction with habits of business, in such a manner as to enable men to consider things either in general, or in detail, as the occasion may require. Whichever of these habits may happen to gain an undue ascendant over the mind, it will necessarily produce a character limited in its powers, and fitted only for particular exertions. Hence some of the apparent inconsistencies which we may frequently remark in the intellectual capacities of the same person. One man, from an early indulgence in abstract speculation, possesses a knowledge of general principles, and a talent for general reasoning, united with a fluency and eloquence in the use of general terms, which seem, to the vulgar, to announce abilities fitted for any given situation in life; while, in the conduct of the simplest affairs, he exhibits every mark of irresolution and incapacity. Another not only acts with propriety and skill in circumstances which require a minute attention to details, but possesses an acuteness of reasoning, and a facility of expression on all subjects, in which nothing but what is particular is involved; while on general topics, he is perfectly unable either to reason or to judge. It is this last turn of mind, which I think we have, in most instances, in view, when we speak of *good sense*, or *common sense*, in opposition to *science* and *philosophy*. Both philosophy and good sense imply the exercise of our reasoning powers; and they differ from each other only according as these powers are applied to particulars or to generals. It is on good sense (in the acceptation in which I have now explained the term), that the success of men in the inferior walks of life chiefly depends; but, that it does not always indicate capacity for abstract science or for general speculation, or for able conduct in situations which require comprehensive views, is matter even of vulgar remark.

Natural superiority of the men of general views. — Although, however, each of these defects has a tendency to limit the utility of the individuals in whom it is to be found, to certain stations in society; no comparison can be made, in point of original value, between the intellectual capacities of the two classes of men to which they characteristically belong. The one is the defect of a vigorous, an ambitious, and a comprehensive genius, improperly directed; the other, of an understanding minute and circumscribed in its views, timid in its exertions, and formed for servile imitation. Nor is the former defect, (however difficult it may be to remove it when confirmed by long habit,) by any means so incurable as the latter; for it arises, not from original constitution, but from some fault in early education; while every tendency to the opposite extreme is more or less characteristical of a mind, useful, indeed, in a high degree, when confined to its proper sphere, but destined, by the hand that formed it, to borrow its lights from another.

As an additional proof of the natural superiority which men of general views possess over the common drudges in business, it may be further observed, that the habits of inattention incident to the former arise in part from the little interest which they take in particular objects and particular occurrences, and are not wholly to be ascribed to an incapacity of attention. When the mind has been long accustomed to the consideration of classes of objects and of comprehensive theorems, it cannot, without some degree of effort, descend to that humble walk of experience, or of action, in which the meanest of mankind are on a level with the greatest. In important situations, accordingly, men of the most general views are found not to be inferior to the vulgar in their attention to details; because the objects and occurrences which such situations present, rouse their passions, and interest their curiosity, from the magnitude of the consequences to which they lead.

When theoretical knowledge and practical skill are happily combined in the same person, the intellectual power of man appears in its full perfection; and fits him equally to conduct, with a masterly hand, the details of ordinary business, and to contend successfully with the untried difficulties of new and hazardous situations. In conducting the former, mere experience may frequently be a sufficient guide; but experience and speculation must be combined together to prepare us for the latter. "Expert men," says Lord Bacon, "can execute and judge of particulars one by one; but the general counsels, and the plots, and the marshalling of affairs, come best from those that are learned."

CHAPTER V.

OF THE ASSOCIATION OF IDEAS.

THE subject on which I am now to enter, naturally divides itself into Two Parts. The *First* relates to the influence of Association in regulating the succession of our thoughts; the *Second*, to its influence on the intellectual powers, and on the moral character, by the more intimate and indissoluble combinations which it leads us to form in infancy and in early youth. The two inquiries, indeed, run into each other; but it will contribute much to the order of our speculations, to keep the foregoing arrangement in view.

PART I.

OF THE INFLUENCE OF ASSOCIATION IN REGULATING THE SUCCESSION OF OUR THOUGHTS.

§ I. *General Observations on this Part of our Constitution, and on the Language of Philosophers with respect to it.*—That one thought is often suggested to the mind by another; and that the sight of an external object often recalls former occurrences, and revives former feelings, are facts which are perfectly familiar, even to those who are the least disposed to speculate concerning the principles of their nature. In passing along a road which we have formerly travelled in the company of a friend, the particulars of the conversation in which we were then engaged, are frequently suggested to us by the objects we meet with. In such a scene, we recollect that a particular subject was started; and in passing the different houses, and plantations, and rivers, the arguments we were discussing when we last saw them, recur spontaneously to the memory. The connection which is formed in the mind between the words of a language and the ideas they denote; the connection which is formed between the different words of a discourse we have committed to memory; the connection between the different notes of a piece of music in the mind of the musician, are all obvious instances of the same general law of our nature.

The influence of *perceptible* objects in reviving former thoughts and former feelings, is more particularly remarkable. After time has, in some degree, reconciled us to the death of a friend, how wonderfully are we affected the first time we enter the house where he lived. Every thing we see; the apartment where he studied; the chair upon which he sat, recall to us the happiness we have enjoyed together; and we should feel it a sort of violation of that respect we owe to his memory, to engage in any light or indifferent discourse when such objects are before us. In the case, too, of those remarkable scenes which interest the curiosity, from the memorable persons or transactions which we have been accustomed to connect with them in the course of our studies, the fancy is more awakened by the actual perception of the scene itself, than by the mere conception or imagination of it. Hence the pleasure we enjoy in visiting classical ground; in beholding the retreats which inspired the genius of our favorite authors, or the fields which have been dignified by exertions of heroic virtue. How feeble are the emotions produced by the liveliest conception of modern Italy, to what the poet felt, when, amidst the ruins of Rome,

> "He drew th' inspiring breath of ancient arts,
> ——— And trod the sacred walks
> Where, at each step, imagination burns!"

The well-known effect of a particular tune on Swiss regiments, when at a distance from home, furnishes a very striking illustration of the peculiar power of a perception, or of *an impression on the senses,* to awaken associated thoughts and feelings; and numberless facts of a similar nature must have occurred to every person of moderate sensibility, in the course of his own experience.

"Whilst we were at dinner," says Captain King, "in this miserable hut, on the banks of the river Awatska, the guests of a people with whose existence we had before been scarce acquainted, and at the extremity of the habitable globe; a solitary, half-worn pewter spoon, whose shape was familiar to us, attracted our attention; and, on examination, we found it stamped on the back with the word *London.* I cannot pass over this circumstance in silence, out of gratitude for the many pleasant thoughts, the anxious hopes, and tender remembrances, it excited in us. Those who have experienced the effects that long absence, and extreme distance from their native country, produce on the mind, will readily conceive the pleasure such a trifling incident can give."

The difference between the effect of a perception and an idea, in awakening associated thoughts and feelings, is finely described in the introduction to the fifth book *De Finibus.*

"We agreed," says Cicero, "that we should take our afternoon's walk in the academy, as at that time of the day it was a place where there was no resort of company. Accordingly, at the hour appointed, we went to Piso's. We passed the time in conversing on different matters during our short walk from the double gate, till we came to the academy, that justly celebrated spot, which, as we wished, we found a perfect solitude. I know not," said Piso, "whether it be a natural feeling, or an illusion of the imagination founded on habit, that we are more powerfully affected by the sight of those places which have been much frequented by illustrious men, than when we either listen to the recital, or read the detail, of their great actions. At this moment, I feel strongly that emotion which I speak of. I see before me the perfect form of Plato, who was wont to dispute in this very place; these gardens not only recall him to my memory, but present his very person to my senses. I fancy to myself, that here stood Speusippus, there Xenocrates, and here, on this bench, sat his disciple Polemo. To me, our ancient senate-house seems peopled with the like visionary forms; for, often, when I enter it, the shades of Scipio, of Cato, and of Lælius, and, in particular, of my venerable grandfather, rise to my imagination. In short, such is the effect of local situation in recalling associated ideas to the mind, that it is not without reason, some philosophers have founded on this principle a species of artificial memory."

This influence of perceptible objects, in awakening associated thoughts and associated feelings, seems to arise, in a great measure, from their permanent operation as exciting or suggesting causes. When a train of thought takes its rise from an idea or conception, the first idea soon disappears, and a series of others succeeds, which are gradually less and less related to that with which the train commenced: but in the case of perception, the exciting cause remains steadily before us; and all the thoughts and feelings which have any relation to it, crowd into the mind in rapid succession; strengthening each other's effects, and all conspiring in the same general impression.

Common maxims of conduct founded on the association of ideas. — I have already observed, that the connections which exist among our thoughts, have been long familiarly known to the vulgar as well as to philosophers. It is, indeed, only of late that we have been possessed of an appropriated phrase to express them; but that the general fact is not a recent discovery, may be inferred from many of the common maxims of prudence and of propriety, which have plainly been suggested by an attention to this part of our constitution. When we lay it down, for example, as a general rule, to avoid in conversation all expressions, and all topics of discourse, which have any relation, however remote, to ideas of an unpleasant nature, we plainly proceed on the supposition that there are certain connections among our thoughts, which have an influence over the order of their succession. It is unnecessary to remark, how much of the comfort and good-humor of social life depends on an attention to this consideration. Such attentions are more particularly essential in our intercourse with men of the world; for the commerce of society has a wonderful effect in increasing the quickness and the facility with which we associate all ideas which have any reference to life and manners;* and, of consequence, it must render the sensibility alive to many circumstances which, from the remoteness of their relation to the situation and history of the parties, would otherwise have passed unnoticed.

When an idea, however, is thus suggested by association, it produces a slighter impression, or, at least, it produces its impression more gradually, than if it were presented more directly and immediately to the mind. And hence, when we are under a necessity of communicating any disagreeable information to another, delicacy leads us, instead of mentioning the thing itself, to mention something else from which our meaning may be understood. In this manner, we prepare our hearers for the unwelcome intelligence.

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* The superiority which the man of the world possesses over the recluse student, in his knowledge of mankind, is partly the result of this quickness and facility of association. Those trifling circumstances in conversation and behavior, which, to the latter, convey only their most obvious and avowed meaning, lay open to the former many of the trains of thought which are connected with them, and frequently give him a distinct view of a character, on that very side where it is supposed to be most concealed from his observation.

The distinction between gross and delicate flattery is founded upon the same principle. As nothing is more offensive than flattery which is direct and pointed, praise is considered as happy and elegant in proportion to the slightness of the associations by which it is conveyed.

Objections to the phrase, association of ideas.—To this tendency which one thought has to introduce another, philosophers have given the name of the *Association of Ideas;* and as I would not wish, excepting in case of necessity, to depart from common language, or to expose myself to the charge of delivering old doctrines in a new form, I shall continue to make use of the same expression. I am sensible, indeed, that the expression is by no means unexceptionable; and that, if it be used, as it frequently has been, to comprehend those laws by which the succession of all our thoughts and of all our mental operations is regulated, the word *idea* must be understood in a sense much more extensive than it is commonly employed in. It is very justly remarked by Dr. Reid, that "memory, judgment, reasoning, passions, affections, and purposes; in a word, every operation of the mind, excepting those of sense, is excited occasionally in the train of our thoughts; so that, if we make the train of our thoughts to be only a train of ideas, the word *idea* must be understood to denote all these operations." In continuing, therefore, to employ, upon this subject, that language which has been consecrated by the practice of our best philosophical writers in England, I would not be understood to dispute the advantages which might be derived from the introduction of a new phrase, more precise and more applicable to the fact.*

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* [Instead of the common phrase, *association of ideas,* Dr. Thomas Brown prefers, for reasons which he has stated with great acuteness, the simple term, *suggestion.* After remarking, as Reid and Stewart had done before him, that not only *ideas,* but emotions, purposes, judgments, and all

The relations of habit to the association of ideas. — The ingenious author whom I last quoted, seems to think that the *association of ideas* has no claim to be considered as an original principle, or as an ultimate fact in our nature. " I believe," says he, " that the original principles of the mind, of which we can give no account, but that such is our constitution, are more in number than is commonly thought. But we ought not to multi-

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other operations of mind, succeed each other in *trains of thought and feeling* by virtue of this faculty, he observes, that the term *association* seems to imply that the two ideas or affections, the one of which serves to call up, or remind us of, the other, were formerly present to the mind together, and were then *associated*, or so connected with each other, that, ever afterwards, one could not occur without bringing up the other also. In other words, he thinks the term *association* implies *previous* association ; and to this hypothesis he opposes the well-known fact, " that an object seen *for the first time* does suggest many relative conceptions." " In this case, at least, there cannot have been any *previous* connection of that which suggests with that which is suggested." " That the perception of a giant, which had never before coexisted with the idea of a dwarf, should yet be sufficient, *without some prior association*, to induce that idea, may seem very wonderful; but wonderful as it is, it is really not more mysterious than if the two ideas had coexisted, or succeeded each other, innumerable times. The great mystery is in the simple fact of the recurrence or spontaneous rise of any idea, without the recurrence of the external cause which produced it; and when that external cause has ceased, perhaps, to have any existence." Take Byron's vivid description of the Dying Gladiator, as an instance to show how *present perceptions*, however strong and startling in character, may yet fail to call away the mind's attention from the thoughts and scenes of other days, now long distant, though the latter are not suggested by any object of sense, but only by a train of ideas and passions that were brought together by the principle of opposition or contrast.

" And now
The arena swims around him, — he is gone,
Ere ceased the inhuman shout which hailed the wretch who won.

" *He heard it, but he heeded not,* — his eyes
Were with his heart, and *that was far away.*
He recked not of the life he lost, nor prize ;
But where his rude hut by the Danube lay,
There were his young barbarians all at play,
There was their Dacian mother " —]

ply them without necessity. That trains of thinking, which by frequent repetition have become familiar, should spontaneously offer themselves to our fancy, seems to require no other original quality but the power of habit."

With this observation I cannot agree; because I think it more philosophical to resolve the power of habit into the association of ideas, than to resolve the association of ideas into habit.

The word *habit,* in the sense in which it is commonly employed, expresses that facility which the mind acquires, in all its exertions, both animal and intellectual, in consequence of practice. We apply it to the dexterity of the workman; to the extemporary fluency of the orator; to the rapidity of the arithmetical accountant. That this facility is the effect of practice, we know from experience to be a fact; but it does not seem to be an ultimate fact, nor incapable of analysis.

In the Essay on Attention, I showed that the effects of practice are produced partly on the body, and partly on the mind. The muscles which we employ in mechanical operations, become stronger, and become more obedient to the will. This is a fact, of which it is probable that philosophy will never be able to give any explanation.

But even in mechanical operations, the effects of practice are produced partly on the mind; and, as far as this is the case, they are resolvable into what philosophers call the *association of ideas,* or into that general fact which Dr. Reid himself has stated, "that trains of thinking, which, by frequent repetition, have become familiar, spontaneously offer themselves to the mind." In the case of habits which are purely intellectual, the effects of practice resolve themselves completely into this principle: and it appears to me more precise and satisfactory, to state the principle itself as a law of our constitution, than to slur it over under the concise appellation of *habit,* which we apply in common to mind and body.

Association of ideas distinguished from imagination.—The tendency in the human mind to associate or connect its thoughts together, is sometimes called, but very improperly, the *imagination.* Between these two parts of our constitution, there is, indeed, a very intimate relation; and it is probably owing to this relation, that they have been so generally confounded under the same name. When the mind is occupied about absent objects of sense, (which, I believe, it is habitually in the great majority of mankind,) its train of thought is merely a series of conceptions; or, in common language, of imaginations. In the case, too, of poetical imagination, it is the association of ideas that supplies the materials out of which its combinations are formed; and when such an imaginary combination is become familiar to the mind, it is the association of ideas that connects its different parts together, and unites them into one whole. The association of ideas, therefore, although perfectly distinct from the power of imagination, is immediately and essentially subservient to all its exertions.

Fancy distinguished from imagination. — The last observation seems to me to point out, also, the circumstance which has led the greater part of English writers to use the words *imagination and fancy as synonymous.* It is obvious, that a creative imagination, when a person possesses it so habitually that it may be regarded as forming one of the characteristics of his genius, implies a power of summoning up, at pleasure, a particular class of ideas, and of ideas related to each other in a particular manner; which power can be the result only of certain habits of association, which the individual has acquired.

It is to this power of the mind, which is evidently a particular turn of thought, and not one of the common principles of our nature, that our best writers (so far as I am able to judge) refer, in general, when they make use of the word *fancy;* I say, in general; for in disquisitions of this sort, in which the best writers are seldom precise and steady in the employment of words, it is only to their prevailing practice that we can appeal as an authority. What the particular relations are, by which those ideas are connected that are subservient to poetical imagination, I shall not inquire at present. I think they are chiefly those of resemblance and analogy. But whatever they may be, the power of summoning up at pleasure the ideas so related, as it is the groundwork of poetical genius, is of sufficient importance in the human constitution to deserve an appropriated name; and, for this purpose, the word *fancy* would appear to be the most convenient that our language affords.

Dr. Reid has somewhere observed, that "the part of our constitution on which the association of ideas depends, was called, by the older English writers, *the fantasy* or *fancy;*" a use of the word, we may remark, which coincides, in many instances, with that which I propose to make of it. It differs from it only in this, that these writers applied it to the association of ideas in general, whereas I restrict its application to that habit of association, which is subservient to poetical imagination.

According to the explanation which has now been given of the word *fancy, the office of this power is to collect materials for the imagination;* and, therefore, the latter power presupposes the former, while the former does not necessarily suppose the latter. A man whose habits of association present to him, for illustrating or embellishing a subject, a number of resembling, or of analogous ideas, we call a man of fancy: but for an effort of imagination, various other powers are necessary, particularly the powers of taste and of judgment; without which, we can hope to produce nothing that will be a source of pleasure to others. It is the power of fancy which supplies the poet with metaphorical language, and with all the analogies which are the foundation of his illusions; but it is the power of imagination that creates the complex scenes he describes, and the fictitious characters he delineates. To fancy, we apply the epithets of rich or luxuriant; to imagination, those of beautiful or sublime.*

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* [Though the best writers, as Stewart remarks, are seldom steady and precise in the use of two terms so nearly related to each other as *fancy* and *imagination,* we think these two faculties may yet be distinguished from each other by a broader line of separation than the one marked out in the text. In fact, the assertion that it is the office of fancy only to furnish the materials for the imagination to work upon, if it be understood to mean, that fancy merely reproduces the sights and sounds, the thoughts and feelings, that were known before, without altering or refashioning them, or

II. *Of the principles of association among our ideas.* — The facts which I stated in the former Section, to illustrate the tendency of a perception, or of an idea, to suggest ideas related to it, are so obvious as to be matter of common remark. But the relations which connect all our thoughts together, and the laws which regulate their succession, were but little attended to before the publication of Mr. Hume's writings.

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combining them anew, is contradicted by the usage both of poets and critics.

"So full of shapes is fancy,
That it alone is high fantastical;" —

and it throws its materials together into combinations so new and fanciful, that the likeness of them cannot be found on the earth or under the earth. A "fancy picture," or a "fancy sketch," is commonly understood to mean an ideal combination of things often found separate in nature, but never before found together. The leading characteristic of such fancy work is, that it is recognized *at the moment* to be unreal, or fantastic.

But imagination, as Stewart has here pointed out, is accompanied by belief; it is, for the moment, a delusion, or a phrenzy. It assumes, or takes for granted, the reality of its own creations. Where fancy sees only a resemblance, imagination beholds identity. Hence, the appropriate figure of speech for the one, is a simile; for the other, a metaphor or trope. Donne's witty comparison of husband and wife to a pair of compasses, —

"The one doth in the centre sit,
And when the other far does roam,
It leans and hearkens after it,
And grows erect as it comes home" —

is, in itself, purely fanciful; for it is an avowed comparison. But one portion of it, — that which we have italicized, — is of imagination all-compact; for one half of the compasses is here not merely *fancied* to be a human being, but, on the supposition that it *is* a human being, corresponding affections, purposes, and actions are attributed to it. So, in Shakspeare's magnificent description of daybreak, —

"See, love! what envious streaks
Do lace the severing clouds in yonder East;
Night's candles are burnt out, and jocund Day
Stands tiptoe on the misty mountain tops" —

the poet's mind is all aglow with imagination, and the most daring prosopopœia becomes the instinctive language of truth itself.]

It is well known to those who are in the least conversant with the present state of metaphysical science, that this eminent writer has attempted to reduce all the principles of association among our ideas to three: *Resemblance*, *Contiguity in time and place*, and *Cause and Effect*. The attempt was great, and worthy of his genius; but it has been shown by several writers since his time,* that his enumeration is not only incomplete, but that it is even indistinct, so far as it goes.

It is not necessary for my present purpose, that I should enter into a critical examination of this part of Mr. Hume's system; or that I should attempt to specify those principles of association which he has omitted. Indeed, it does not seem to me, that the problem admits of a satisfactory solution; for there is no possible relation among the objects of our knowledge, which may not serve to connect them together in the mind; and, therefore, although one enumeration may be more comprehensive than another, a perfectly complete enumeration is scarcely to be expected.

Nor is it merely in consequence of the relations among *things*, that our notions of them are associated: they are frequently coupled together by means of relations among the *words* which denote them; such as a similarity of sound, or other circumstances still more trifling. The alliteration which is so common in poetry, and in proverbial sayings, seems to arise, partly at least, from associations of ideas founded on the accidental circumstance, of the two words which express them beginning with the same letter.

> "But thousands die, without or this or that;
> Die, and endow a college, or a cat." —Pope's Ep. to Lord Bathurst.
>
> "Ward tried, on puppies and the poor, his drop." — Id. Imitat. of Horace.
>
> "Puffs, powders, patches; bibles, billet-doux." —Rape of the Lock.

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* It is observed by Dr. Beattie, that something like an attempt to enumerate the laws of association is to be found in Aristotle, who, in speaking of recollection, insinuates, with his usual brevity, that "the relations, by which we are led from one thought to another, in tracing out, or *hunting after*," as he calls it, "any particular thought which does not immediately occur, are chiefly three, *resemblance*, *contrariety*, and *contiguity*."

This indeed pleases only on slight occasions, when it may be supposed that the mind is in some degree playful, and under the influence of those principles of association which commonly take place when we are careless and disengaged. Every person must be offended with the second line of the following couplet, which forms part of a very sublime description of the Divine power:—

"Breathes in our soul, informs our mortal part,
As full, as perfect, in a hair as heart."—Essay on Man, Ep. i.

To these observations, it may be added, that things which have no known relation to each other are often associated in consequence of their producing similar effects on the mind. Some of the finest poetical allusions are founded on this principle; and accordingly, if the reader is not possessed of sensibility congenial to that of the poet, he will be apt to overlook their meaning, or to censure them as absurd. To such a critic, it would not be easy to vindicate the beauty of the following stanza, in an ode addressed to a lady by the author of the "Seasons:"—

"O thou, whose tender, serious eye,
Expressive speaks the soul I love;
The gentle azure of the sky,
The pensive shadows of the grove."

The principles of association divided into two classes.—I have already said, that the view of the subject which I propose to take, does not require a complete enumeration of our principles of association. There is, however, an important distinction among them, to which I shall have occasion frequently to refer; and which, as far as I know, has not hitherto attracted the notice of philosophers. The relations upon which *some* of them are founded, are *perfectly obvious* to the mind; those which are the foundation of *others, are discovered only in consequence of particular efforts of attention.* Of the former kind, are the relations of *resemblance* and *analogy*, of *contrariety*, of *vicinity in time and place*, and those which arise from *accidental coincidences in the sound* of different words. These, in general, connect our thoughts together, when they are suffered to take their natural course, and when we are conscious of little or no active exertion. Of the latter kind, are the relations of *cause and effect*, of *means and end*, of *premises and conclusion;* and those others, which regulate the train of thought in the mind of the philosopher when he is engaged in a particular investigation.

It is owing to this distinction, that transitions, which would be highly offensive in philosophical writing, are the most pleasing of any in poetry. In the former species of composition, we expect to see an author lay down a distinct plan or method, and observe it rigorously; without allowing himself to ramble into digressions, suggested by the accidental ideas or expressions, which may occur to him in his progress. In that state of mind in which poetry is read, such digressions are not only agreeable, but necessary to the effect; and an arrangement founded on the spontaneous and seemingly casual order of our thoughts, pleases more than one suggested by an accurate analysis of the subject.

How absurd would the long digression in praise of industry, in Thomson's "Autumn," appear, if it occurred in a prose essay! a digression, however, which, in that beautiful poem, arises naturally and insensibly from the view of a luxuriant harvest; and which as naturally leads the poet back to the point where his excursion began: —

> "All is the gift of industry; whate'er
> Exalts, embellishes, and renders life
> Delightful. Pensive Winter, cheered by him,
> Sits at the social fire, and happy hears
> Th' excluded tempest idly rave along;
> His harden'd fingers deck the gaudy Spring;
> Without him Summer were an arid waste;
> Nor to th' Autumnal months could thus transmit
> Those full, mature, immeasurable stores,
> That, waving round, recall my wand'ring song."

In Goldsmith's "Traveller," the transitions are managed with consummate skill; and yet how different from that logical method which would be suited to a philosophical discourse on the state of society in the different parts of Europe! Some of the finest are suggested by the associating principle of contrast. Thus, after describing the effeminate and debased Roman, the poet proceeds to the Swiss:—

"My soul turn from them — turn we to survey
Where rougher climes a nobler race display."

And, after painting some defects in the manners of this gallant but unrefined people, his thoughts are led to those of the French:—

"To kinder skies, where gentler manners reign,
I turn — and France displays her bright domain."

The transition which occurs in the following lines, seems to be suggested by the accidental mention of a word: and is certainly one of the happiest in our language:—

"Heavens! how unlike their Belgic sires of old!
Rough, poor, content, ungovernably bold;
War in each breast, and freedom on each brow,
How much unlike the sons of Britain now!
— Fired at the sound, my genius spreads her wing,
And flies, where Britain courts the western spring.'

Numberless illustrations of the same remark might be collected from the ancient poets, more particularly from the Georgics of Virgil, where the singular felicity of the transitions has attracted the notice even of those who have been the least disposed to indulge themselves in philosophical refinement concerning the principles of criticism. A celebrated instance of this kind occurs in the end of the first book; the consideration of the weather and of its common prognostics leading the fancy, in the first place, to those more extraordinary phenomena which, according to the superstitious belief of the vulgar, are the forerunners of political revolutions; and afterwards to the death of Cæsar, and the battles of Pharsalia and Philippi. The manner in which the poet returns to his original subject, displays that exquisite art which is to be derived only from the diligent and enlightened study of nature.

"Scilicet et tempus veniet cùm finibus illis
Agricola, incurvo terram molitus aratro,

> Exesa invenient scabrâ rubigine pila;
> Aut gravibus rastris galeas pulsabit inanes,
> Grandiaque effossis mirabitur ossa sepulchris."

Ideas are associated more readily in the minds of some persons than of others. — The facility with which ideas are associated in the mind, is very different in different individuals; a circumstance which, as I shall afterwards show, lays the foundation of remarkable varieties among men, both in respect of genius and of character. I am inclined, too, to think that, in the other sex, (probably in consequence of early education,) ideas are more easily associated together than in the minds of men. Hence the liveliness of their fancy, and the superiority they possess in epistolary writing, and in those kinds of poetry in which the principal recommendations are, ease of thought and expression. Hence, too, the facility with which they contract or loose habits, and accommodate their minds to new situations; and I may add, the disposition they have to that species of superstition which is founded on accidental combinations of circumstances. The influence which this facility of association has on the power of taste, shall be afterwards considered.

III. *Of the power which the mind has over the train of its thoughts.* — By means of the association of ideas, a constant current of thoughts, if I may use the expression, is made to pass through the mind while we are awake. Sometimes the current is interrupted, and the thoughts diverted into a new channel, in consequence of the ideas suggested by other men, or of the objects of perception with which we are surrounded. So completely, however, is the mind, in this particular, subjected to physical laws, that it has been justly observed by Lord Kaimes and others, we cannot, by an effort of our will, call up any one thought; and that the train of our ideas depends on causes which operate in a manner inexplicable by us.

This observation, although it has been censured as paradoxical, is almost self-evident; for, *to call up a particular thought* supposes it to be *already in the mind.* As I shall have frequent occasion, however, to refer to the observation afterwards, I shall endeavor to obviate the only objection which, I think, can reasonably be urged against it; and which is founded on that operation of the mind which is commonly called *recollection* or *intentional memory.*

Intentional memory explained. — It is evident, that before we attempt to recollect the particular circumstances of any event, that event in general must have been an object of our attention. We remember the outlines of the story, but cannot at first give a complete account of it. If we wish to recall these circumstances, there are only two ways in which we can proceed. We must either form different suppositions, and then consider which of these tallies best with the other circumstances of the event; or, by revolving in our mind the circumstances we remember, we must endeavor to excite the recollection of the other circumstances associated with them. The first of these processes is, properly speaking, an inference of reason, and plainly furnishes no exception to the doctrine already delivered. We have an instance of the other mode of recollection, when we are at a loss for the beginning of a sentence, in reciting a composition that we do not perfectly remember; in which case, we naturally repeat over, two or three times, the concluding words of the preceding sentence, in order to call up the other words which used to be connected with them in the memory. In this instance, it is evident, that the circumstances we desire to remember are not recalled to the mind in immediate consequence of an exertion of volition, but are suggested by some other circumstances with which they are connected, independently of our will, by the laws of our constitution.

Notwithstanding, however, the immediate dependence of the train of our thoughts on the laws of association, it must not be imagined that the will possesses no influence over it. This influence, indeed, is not exercised directly and immediately, as we are apt to suppose on a superficial view of the subject: but it is nevertheless, very extensive in its effects; and the different degrees in which it is possessed by different individuals, constitute some of the most striking inequalities among men, in point of intellectual capacity.

Power of the will over the thoughts. — Of the powers which the mind possesses over the train of its thoughts, the most obvious is its power of singling out any one of them at pleasure; of detaining it; and of making it a particular object of attention. By doing so, we not only stop the succession that would otherwise take place; but, in consequence of our bringing to view the less obvious relations among our ideas, we frequently divert the current of our thoughts into a new channel. If, for example, when I am indolent and inactive, the name of Sir Isaac Newton accidentally occur to me, it will perhaps suggest, one after another, the names of some other eminent mathematicians and astronomers, or some of his illustrious contemporaries and friends: and a number of them may pass in review before me, without engaging my curiosity in any considerable degree. In a different state of mind, the name of Newton will lead my thoughts to the principal incidents of his life, and the more striking features of his character: or, if my mind be ardent and vigorous, will lead my attention to the sublime discoveries he made; and gradually engage me in some philosophical investigation. To every object, there are others which bear obvious and striking relations; and others, also, whose relation to it does not readily occur to us, unless we dwell upon it for some time, and place it before us in different points of view.

But the principal power we possess over the train of our ideas, is founded on *the influence which our habits of thinking have on the laws of association;* an influence which is so great, that we may often form a pretty shrewd judgment concerning a man's prevailing turn of thought, from the transitions he makes in conversation or in writing. It is well known, too, that by means of habit, a particular associating principle may be strengthened to such a degree, as to give us a command of all the different ideas in our mind, which have a certain relation to each other; so that, when any one of the class occurs to us, we have almost a certainty that it will suggest the rest. What confidence in his own powers must a speaker possess, when he rises without premeditation, in a popular assembly, to amuse his audience with a lively or a humorous speech! Such a confidence, it is evident, can only arise from a long experience of the strength of particular associating principles.

Habits of association facilitate the exercise of various powers of mind. — To how great a degree this part of our constitution may be influenced by habit, appears from facts which are familiar to every one. A man who has an ambition to become a punster, seldom or never fails in the attainment of his object; that is, he seldom or never fails in acquiring a power which other men have not, of summoning up, on a particular occasion, a number of words different from each other in meaning, and resembling each other, more or less, in sound. I am inclined to think that even genuine wit is a habit acquired in a similar way; and that, although some individuals may, from natural constitution, be more fitted than others to acquire this habit; it is founded in every case on a peculiarly strong association among certain classes of our ideas, which gives the person who possesses it, a command over those ideas, which is denied to ordinary men. But there is no instance in which the effects of habits of association is more remarkable than in those men who possess a facility of rhyming. That a man should be able to express his thoughts perspicuously and elegantly, under the restraints which rhyme imposes, would appear to be incredible, if we did not know it to be fact. Such a power implies a wonderful command both of ideas and of expressions; and yet daily experience shows that it may be gained with very little practice. Pope tells us with respect to himself, that he could express himself, not only more concisely, but more easily, in rhyme than in prose.*

Nor is it only in these trifling accomplishments that we may trace the influence of habits of association. In every instance of invention, either in the fine arts, in the mechanical arts, or in the sciences, there is some new idea, or some new combination of ideas, brought to light by the inventor. This, undoubtedly, may often happen in a way which he is unable to explain: that is, his invention may be suggested to him by some lucky thought, the origin of which he is unable to trace. But when a man possesses an habitual fertility of invention in any particular art or science, and can rely, with confidence, on his inventive powers, whenever he is called upon to exert them, he must have acquired, by previous habits of study, a command over certain classes of his ideas, which enables him, at pleasure, to bring them under his review. The illustration of these subjects may throw light on some processes of the mind, which are not in general well understood: and I shall accordingly, in the following section, offer a few hints with respect to those habits of association which are the foundation of wit; of the power of rhyming; of poetical fancy; and of invention in matters of science.

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* "When habit is once gained, nothing so easy as practice. Cicero writes, that Antipater, the Sidonian, could pour forth hexameters extempore; and that, whenever he chose to versify, words followed him of course. We may add to Antipater, the ancient rhapsodists of the Greeks, and the modern improvisatori of the Italians." — Harris's Phil. Inq. 108, 110.

IV. *Illustrations of this doctrine.* 1. *Of wit.*—According to Locke, Wit consists "in the assemblage of ideas; and putting those together with quickness and variety, wherein can be found any resemblance or congruity." I would add to this definition, (rather by way of comment than of amendment,) that *wit implies a power of calling up at pleasure the ideas which it combines;* and I am inclined to believe, that the entertainment which it gives to the hearer is founded, in a considerable degree, on his *surprise* at the command which the man of wit has acquired over a part of the constitution, which is so little subject to the will.

That the effect of wit depends partly, at least, on the circumstance now mentioned, appears evidently from this, that we are more pleased with a *bon mot* which occurs in conversation, than with one in print; and that we never fail to receive disgust from wit, when we suspect it to be premeditated. The pleasure, too, we receive from wit, is heightened, when the original idea is started by one person, and the related idea by another. Dr. Campbell has remarked, that "a witty repartee is infinitely more pleasing than a witty attack; and that an allusion will appear excellent when thrown out extempore in conversation, which would be deemed execrable in print." In all these cases, *the wit considered absolutely is the same.* The relations which are discovered between the compared ideas are equally new; and yet, as soon as we suspect that the wit was premeditated, the pleasure we receive from it is infinitely diminished. Instances indeed may be mentioned, in which we are pleased with contemplating an unexpected relation between ideas, without any reference to the habits of association in the mind of the person who discovered it. A *bon mot* produced at the game of cross-purposes, would not fail to create amusement; but in such cases, our pleasure seems chiefly to arise from the surprise we feel at so extraordinary a coincidence between a question and an answer coming from persons who had no direct communication with each other.

Of the effect added to wit by the promptitude with which its combinations are formed, Fuller appears to have had a very just idea, from what he has recorded of the social hours of our two great English Dramatists. "Jonson's parts were not so ready to run of themselves, as able to answer the spur; so that it may be truly said of him, that he had an *elaborate wit*, wrought out by his own industry. Many were the wit combats between him and Shakspeare, which two I behold like a Spanish great galleon, and an English man-of-war. Jonson, like the former, was built far higher in learning; solid, but slow in his performances. Shakspeare, with the English man-of-war, lesser in bulk, but lighter in sailing, could turn with all tides, tack about and take advantage of all winds, by the quickness of his wit and invention."

I before observed, that the pleasure we receive from wit is increased, when the two ideas between which the relation is discovered, are suggested by different persons. In the case of a *bon mot* occurring in conversation, the reason of this is abundantly obvious; because, when the related ideas are suggested by different persons, we have a proof that the wit was not premeditated. But even in a written composition, we are much more delighted when the subject was furnished to the author by another person, than when he chooses the topic on which he is to display his wit. How much would the pleasure we receive from the *Key to the Lock* be diminished, if we suspected that the author had the key in view when he wrote that poem; and that he introduced some expressions, in order to furnish a subject for the wit of the commentator. How totally would it destroy the pleasure we receive from a parody on a poem, if we suspected that both were productions of the same author? The truth seems to be, that when both the related ideas are suggested by the same person, we have not a very satisfactory proof of any thing uncommon in the intellectual habits of the author. We may suspect that both ideas occurred to him at the same time; and we know that, in the dullest and most phlegmatic minds, such extraordinary associations will sometimes take place. But when the subject of the wit is furnished by one person, and the wit suggested by another, we have a proof, not only that the author's mind abounds with such singular associations, but that he has his wit perfectly at command.

The effect of wit increased by the limitations and difficulties of the subject. — As an additional confirmation of these observations, we may remark, that the more an author is limited by his subject, the more we are pleased with his wit. And, therefore, the effect of wit does not arise solely from the unexpected relations which it presents to the mind, but arises, in part, from the surprise it excites at those intellectual habits which give it birth. It is evident, that the more the author is circumscribed in the choice of his materials, the greater must be the command which he has acquired over those associating principles on which wit depends, and of consequence, according to the foregoing doctrine, the greater must be the surprise and the pleasure which his wit produces. In Addison's celebrated verses to Sir Godfrey Kneller on his picture of George the First, in which he compares the painter to Phidias, and the subjects of his pencil to the Grecian Deities, the range of the poet's wit was necessarily confined within very narrow bounds; and what principally delights us in that performance is, the surprising ease and felicity with which he runs the parallel between the English history and the Greek mythology. Of all the allusions which the following passage contains, there is not one, taken singly, of very extraordinary merit; and yet the effect of the whole is uncommonly great, from the singular power of combination, which so long and so difficult an exertion discovers.

"Wise Phidias thus, his skill to prove,
Thro' many a god advanced to Jove,
And taught the polish'd rocks to shine
With airs and lineaments divine,
Till Greece amaz'd and half afraid,
Th' assembled Deities survey'd.
  Great Pan, who wont to chase the fair,
And lov'd the spreading oak, was there;
Old Saturn, too, with up-cast eyes,
Beheld his abdicated skies;
And mighty Mars, for war renown'd,
In adamantine armor frown'd;
By him the childless Goddess rose,
Minerva, studious to compose
Her twisted threads; the web she strung,
And o'er a loom of marble hung;
Thetis, the troubled ocean's queen,
Match'd with a mortal next was seen,
Reclining on a funeral urn,
Her short-liv'd darling son to mourn;
The last was he, whose thunder slew
The Titan race, a rebel crew,
That from a hundred hills ally'd,
In impious league their King defy'd.*

According to the view which I have given of the nature of wit, the pleasure we derive from that assemblage of ideas which it presents, is greatly heightened and enlivened by our surprise at the command displayed over a part of the constitution, which, in our own case, we find to be so little subject to the will. We consider wit as a sort of feat or trick of intellectual dexterity, analogous, in some respects, to the extraordinary performances of jugglers and rope-dancers; and, in both cases, the pleasure we receive from the exhibition, is explicable *in part,* (I, by no means, say *entirely,*) on the same principles.

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* [As this parallel between English history and Grecian mythology may not be as clear and intelligible to American as to English pupils, and as some of the comparisons, in spite of Stewart's commendation of them, may even appear dull and far-fetched, a few words of commentary may not seem useless. "Great Pan" stands for Charles II., who once escaped his pursuers by ensconcing himself in an oak tree, and whose loves were more numerous than select. James II., who feebly lost a throne which, in the gentle but lying phrase of the day, he was said to have "abdicated," is here likened to Saturn. "Mighty Mars" is William of Orange, "re-

If these remarks be just, it seems to follow as a consequence, that those men who are most deficient in the power of prompt combination, will be most poignantly affected by it, when exerted at the will of another: and therefore, the charge of jealousy and envy brought against rival wits, when disposed to look grave at each other's jests, may perhaps be obviated in a way less injurious to their character.

The same remarks suggest a limitation, or rather an explanation, of an assertion of Lord Chesterfield's, that "genuine wit never made any man laugh since the creation of the world." The observation, I believe to be just, if by genuine wit, we mean wit wholly divested of every mixture of humor: and if by laughter, we mean that convulsive and noisy agitation which is excited by the ludicrous. But there is unquestionably a *smile* appropriated to the flashes of wit; a smile of surprise and wonder;—not altogether unlike the effect produced on the mind and the countenance by a feat of legerdemain, when executed with uncommon success.

2. *Of rhyme.*—The pleasure we receive from rhyme, seems also to arise, partly, from our surprise at the command which

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nowned" for his long wars against Louis XIV; while his consort and the sharer of his throne, the childless Mary, stands for Minerva. Thetis stands for Queen Anne, who was "matched with a mortal"—one who was not a king, though married to a queen—Prince George of Denmark; her "short-lived darling son" was the Duke of Gloucester, who died at the age of twelve years. "The last" was George I., about as poor a representative of "Jove" as could be imagined; the Highlanders—i. e. the rebel "Titans," from "a hundred hills"—attempted in vain to dethrone him in 1715.]

the poet must have acquired over the train of his ideas, in order to be able to express himself with elegance, and the appearance of ease, under the restraint which rhyme imposes. In witty or in humorous performances, this surprise serves to enliven that which the wit or the humor produces, and renders its effects more sensible. How flat do the liveliest and most ludicrous thoughts appear in blank verse? And how wonderfully is the wit of Pope heightened, by the easy and happy rhymes in which it is expressed?

Other sources of pleasure in wit and in rhyme. — It must not, however, be imagined, either in the case of wit or of rhyme, that the pleasure arises solely from our surprise at the uncommon habits of association which the author discovers. In the former case, there must be presented to the mind, an unexpected analogy or relation between different ideas; and perhaps other circumstances must concur to render the wit perfect. If the combination has no other merit than that of bringing together two ideas which never met before, we may be surprised at its oddity, but we do not consider it as a proof of wit. On the contrary, the want of any analogy or relation between the combined ideas, leads us to suspect, that the one did not suggest the other in consequence of any habits of association; but that the two were brought together by study, or by mere accident. All that I affirm is, that when the analogy or relation is pleasing in itself, our pleasure is heightened by our surprise at the author's habits of association when compared with our own. In the case of rhyme, too, there is undoubtedly a certain degree of pleasure arising from the recurrence of the same sound. We frequently observe children amuse themselves with repeating over single words which rhyme together; and the lower people, who derive little pleasure from poetry excepting in so far as it affects the ear, are so pleased with the echo of the rhymes, that when they read verses where it is not perfect, they are apt to supply the poet's defects by violating the common rules of pronunciation. This pleasure, however, is heightened by our admiration at the miraculous powers which the poet must have acquired over the train of his ideas, and over all the modes of expression which the language affords, in order to convey instruction and entertainment, without transgressing the established laws of regular versification. In some of the lower kinds of poetry; for example, in acrostics, and in the lines which are adapted to *bouts-rimés*, the merit lies entirely in this command of thought and expression; or, in other words, in a command of ideas founded on extraordinary habits of association. Even some authors of a superior class occasionally show an inclination to display their knack at rhyming, by introducing, at the end of the first line of a couplet, some word to which the language hardly affords a corresponding sound. Swift, in his more trifling pieces, abounds with instances of this; and in Hudibras, when the author uses his double and triple rhymes, many couplets have no merit whatever but what arises from difficulty of execution.

Chief pleasure derived from rhymes.—The pleasure we receive from rhyme in serious compositions, arises from a combination of different circumstances which my present subject does not lead me to investigate particularly.* I am persuaded, however, that it arises, in part, from our *surprise at the poet's habits of association*, which enable him to convey his thoughts with ease and beauty, notwithstanding the narrow limits within which his choice of expression is confined. One proof of this is, that *if*

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* In elegiac poetry, the occurrence of the same sound, and the uniformity in the structure of the versification which this necessarily occasions, are peculiarly suited to the inactivity of the mind, and to the slow and equable succession of its ideas, when under the influence of tender or melancholy passions; and accordingly, in such cases, even the Latin poets, though the genius of their language be very ill fitted for compositions in rhyme, occasionally indulge themselves in something very nearly approaching to it:—

"Memnona si mater, mater ploravit Achillem,
Et tangant magnas tristia fata Deas;
Flebilis indignos Elegeia solve capillos,
Ah nimis ex vero nunc tibi nomen erit."

Many other instances of the same kind might be produced from the elegiac verses of Ovid and Tibullus.

there appear any mark of constraint, either in the ideas or in the expression, *our pleasure is proportionally diminished.* The thoughts must seem to suggest each other, and the rhymes to be only an accidental circumstance. The same remark may be made on the measure of the verse. When in its greatest perfection, it does not appear to be the result of labor, but to be dictated by nature, or prompted by inspiration. In Pope's best verses, the idea is expressed with as little inversion of style, and with as much conciseness, precision, and propriety, as the author could have attained, had he been writing prose: without any apparent exertion on his part, the words seem spontaneously to arrange themselves in the most musical numbers.

> "While still a child, nor yet a fool to fame,
> I lisp'd in numbers, for the numbers came."

This facility of versification, it is true, may be, and probably is, in most cases, only apparent; and it is reasonable to think, that in the most perfect poetical productions, not only the choice of words, but the choice of ideas, is influenced by the rhymes. In a prose composition, the author holds on in a direct course, according to the plan he has previously formed; but in a poem, the rhymes which occur to him are perpetually diverting him to the right hand or to the left, by suggesting ideas which do not naturally rise out of his subject. This, I presume, is Butler's meaning in the following:—

> "Rhymes the rudder are of verses,
> With which, like ships, they steer their courses."

But although this may be the case in fact, the poet must employ all his art to conceal it: insomuch that if he finds himself under a necessity to introduce, on account of the rhymes, a superfluous idea, or an awkward expression, he must place it *in the first line* of the couplet, and *not in the second;* for the reader, naturally presuming that the lines were composed in the order in which the author arranges them, is more apt to suspect the second line to be accommodated to the first, than the first to the second. And this slight artifice is, in general, sufficient to impose on that degree of attention with which poetry is read.

Who can doubt that, in the following lines, Pope wrote the first for the sake of the second?

> "A wit's a feather, and a chief's a rod;
> An honest man's the noblest work of God."

Were the first of these lines, or a line equally unmeaning, placed last, the couplet would have appeared execrable to a person of the most moderate taste.

Why alliteration is introduced.—It affords a strong confirmation of the foregoing observations, that the poets of some nations have delighted in the practice of alliteration, as well as of rhyme; and have ever considered it as an essential circumstance in versification. Dr. Beattie observes, that "some ancient English poems are more distinguished by alliteration, than by any other poetical contrivance. In the works of Langland, even when no regard is had to rhyme, and but little to a rude sort of anapestic measure, it seems to have been a rule, that three words, at least, of each line should begin with the same letter." A late author informs us, that, in the Icelandic poetry, alliteration is considered as a circumstance no less essential than rhyme. He mentions also several other restraints, which must add wonderfully to the difficulty of versification; and which appear to us to be perfectly arbitrary and capricious. If that really be the case, the whole pleasure of the reader or hearer arises from his surprise at the facility of the poet's composition under these complicated restraints; that is, from his surprise at the command which the poet has acquired over his thoughts and expressions. In our rhyme, I acknowledge that the coincidence of sound is agreeable in itself; and only affirm, that the pleasure which the ear receives from it, is heightened by the other consideration.

3. *Of poetical fancy.*—There is another habit of association which, in some men, is very remarkable; that which is the foundation of poetical fancy: a talent which agrees with wit in some circumstances, but which differs from it essentially in others.

The pleasure we receive from wit, agrees in one particular with the pleasure which arises from poetical allusions; that in both cases, we are pleased with contemplating an analogy between two different subjects. But they differ in this, that the man of wit has no other aim than to combine analogous ideas;* whereas no allusion can, with propriety, have a place in serious poetry, *unless it either illustrate or adorn the principal subject.* If it has both these recommendations, the allusion is perfect. If it has neither, as is often the case with the allusions of Cowley and of Young, the fancy of the poet degenerates into wit.

If these observations be well founded, they suggest a rule with respect to poetical allusions, which has not always been sufficiently attended to. It frequently happens, that two subjects bear an analogy to each other in more respects than one; and where such can be found, they undoubtedly furnish the most favorable of all occasions for the display of wit. But, in serious poetry, I am inclined to think, that however striking these analogies may be, and although each of them might with propriety, be made the foundation of a separate allusion, it is improper, in the course of the same allusion, to include more than one of them; as, by doing so, an author discovers an affectation of wit, or a desire of tracing analogies, instead of illustrating or adorning the subject of his composition.†

Why poetical fancy pleases. — I formerly defined *fancy* to be

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* I speak here of pure and unmixed wit; and not of wit blended, as it is most commonly, with some degree of humor.

† In the following stanza of Shenstone, for example,

How pale was then his true-love's cheek,
  When Jemmy's sentence reached her ear!
For never yet did Alpine snows
  So *pale*, or yet so *chill* appear;"

the double allusion unquestionably borders on conceit. The same double allusion occurs in the translation of Mallet's "William and Margaret," by Vincent Bourne,

"Candidior nive, frigidiorque manus."

How inferior in pathetic simplicity to the original,

And clay cold was the lily hand, etc.

a power of associating ideas according to relations of resemblance and analogy. This definition will probably be thought too general; and to approach too near to that given of wit. In order to discover the necessary limitations, we shall consider what the circumstances are, which please us in poetical allusions. As these allusions are suggested by fancy, and are the most striking instances in which it displays itself, the received rules of critics with respect to them may throw some light on the mental power which gives them birth.

1. An allusion pleases, by illustrating a subject comparatively obscure. Hence, I apprehend, it will be found that allusions from the *intellectual* world to the *material*, are more pleasing, than from the *material* world to the *intellectual*. Mason, in his Ode to Memory, compares the influence of that faculty over our ideas, to the authority of a general over his troops;

> ———" thou, whose sway
> The throng'd ideal hosts obey;
> Who bidst their ranks now vanish, now appear·
> Flame in the van, or darken in the rear."

Would the allusion have been equally pleasing, from a general marshalling his soldiers, to memory and the succession of ideas?

The effect of a literal and spiritless translation of a work of genius, has been compared to that of the figures which we see, when we look at the wrong side of a beautiful piece of tapestry. The allusion is ingenious and happy; but the pleasure which we receive from it arises, not merely from the analogy which it presents to us, but from the illustration which it affords of the author's idea. No one, surely, in speaking of a piece of tapestry, would think of comparing the difference between its sides, to that between an original composition and a literal translation.

Cicero, and after him Mr. Locke, in illustrating the difficulty of attending to the subjects of our consciousness, have compared the mind to the eye, which sees every object around it, but is invisible to itself. To have compared the eye, in this respect, to the mind, would have been absurd.

Mr. Pope's comparison of the progress of youthful curiosity, in the pursuits of science, to that of a traveller among the Alps, has been much, and justly, admired. How would the beauty of the allusion have been diminished, if the Alps had furnished the original subject, and not the illustration!

But although this rule holds in general, I acknowledge, that instances may be produced, from our most celebrated poetical performances, of allusions from *material* objects, both *to the intellectual and the moral worlds.* These, however, are comparatively few in number, and are not to be found in descriptive or in didactic works; but in compositions written under the influence of some particular passion, or which are meant to express some peculiarity in the mind of the author. Thus, a melancholy man who has met with many misfortunes in life, will be apt to moralize on every physical event, and every appearance of nature; because his attention dwells more habitually on human life and conduct, than on the material objects around him. This is the case with the banished Duke, in Shakspeare's *As you like it;* who, in the language of that poet,

> "Finds tongues in trees, books in the running brooks,
> Sermons in stones, and good in every thing."

But this is plainly a distempered state of the mind; and the allusions please, not so much by the analogies they present, as by the picture they give of the character of the person to whom they have occurred.

2. An allusion pleases, by presenting a new and beautiful image to the mind. The analogy or the resemblance between this image and the principal subject, is agreeable of itself, and is indeed necessary, to furnish an apology for the transition which the writer makes; but the pleasure is wonderfully heightened, when the new image thus presented is a beautiful one. The following allusion, in one of Mr. Home's tragedies, appears to me to unite almost every excellence:—

> ———"Hope and fear alternate sway'd his breast;
> Like light and shade upon a waving field,
> Coursing each other, when the flying clouds
> Now hide, and now reveal, the sun."

Here the analogy is remarkably perfect; not only between light and hope, and between darkness and fear; but between the rapid succession of light and shade, and the momentary influences of these opposite emotions; while at the same time, the new image which is presented to us, recalls one of the most pleasing and impressive incidents in rural scenery.

The foregoing observations suggest a reason why the principal stores of *fancy* are commonly supposed to be borrowed from the *material* world. *Wit* has a more extensive province, and delights to display its power of prompt and unexpected combinations over all the various classes of our ideas; but the favorite excursions of fancy are from intellectual and moral subjects to the appearances with which our senses are conversant. The truth is, that such allusions please more than any others in poetry. According to this limited idea of fancy, it presupposes, where it is possessed in an eminent degree, an extensive observation of natural objects, and a mind susceptible of strong impressions from them. It is thus only that a stock of images can be acquired; and that these images will be ready to present themselves, whenever any analogous subject occurs. And hence probably it is, that poetical genius is almost always united with an exquisite sensibility to the beauties of nature.

Before leaving the subject of fancy, it may not be improper to remark that its two qualities are, *liveliness* and *luxuriancy.* The word *lively* refers to the quickness of the association. The word *rich,* or *luxuriant,* to the variety of associated ideas.

4. *Of invention in the arts and sciences.* — To these powers of wit and fancy, that of *invention* in the arts and sciences has a striking resemblance. Like them, *it implies a command over certain classes of ideas, which, in ordinary men, are not equally subject to the will;* and like them, too, it is the result of acquired habits, and not the original gift of nature.

Of the process of the mind in scientific invention, I propose afterwards to treat fully under the article of *reasoning;* and I shall therefore confine myself at present to a few detached remarks upon some views of the subject which are suggested by the foregoing inquiries.

Difference between invention and discovery. — Before we proceed, it may be proper to take notice of the distinction between *invention* and *discovery*. The object of the former, as has been frequently remarked, is to produce something which had no existence before; that of the latter, to bring to light something which did exist, but which was concealed from common observation. Thus we say, Otto Guerricke invented the air-pump; Sanctorius invented the thermometer; Newton and Gregory invented the reflecting telescope; Galileo discovered the solar spots; and Harvey discovered the circulation of the blood. It appears, therefore, that improvements in the arts are properly called *inventions*, and that facts brought to light by means of observation are properly called *discoveries*.

Agreeable to this analogy is the use which we make of these words, when we apply them to subjects purely intellectual. As truth is eternal and immutable, and has no dependence on our belief or disbelief of it, a person who brings to light a truth formerly unknown is said to make a discovery. A person, on the other hand, who contrives a new method of discovering truth, is called an inventor. Pythagoras, we say, discovered the forty-seventh proposition of Euclid's first book; Newton discovered the binomial theorem; but he invented the method of prime and ultimate ratios, and he invented the method of fluxions.

In general, *every advancement in knowledge* is considered as a *discovery; every contrivance by which we produce an effect*, or accomplish an end, is considered as an *invention*. Discoveries in science, therefore, unless they are made by accident, imply the exercise of invention; and accordingly, the word *invention* is commonly used to express originality of genius in the sciences as well as in the arts. It is in this general sense that I employ it in the following observations.

How inventions are made.—It was before remarked, that, in every instance of invention, there is *some new idea, or some new combination of ideas*, which is brought to light by the inventor; and that, although this may sometimes happen in a way which he is unable to explain, yet when a man possesses an habitual fertility of invention in any particular art or science, and can rely with confidence on his inventive powers whenever he is called upon to exert them, he must have acquired, by previous habits of study, *a command over those classes of his ideas which are subservient to the particular effort* that he wishes to make. In what manner this command is acquired, it is not possible, perhaps, to explain completely; but it appears to me to be chiefly in the two following ways. In the *first* place, by his habits of speculation, he may have *arranged* his knowledge in such a manner as may render it easy for him to combine, at pleasure, all the various ideas in his mind which have any relation to the subject about which he is occupied: or, *secondly*, he may have learned by experience certain *general rules*, by means of which he can direct the train of his thoughts into those channels, in which the ideas he is in quest of may be most likely to occur to him.

I. The former of these observations I shall not stop to illustrate particularly at present, as the same subject will occur afterwards under the article of *memory*. It is sufficient for my purpose, in this chapter, to remark, that as habits of speculation have a tendency to classify our ideas, by leading us to refer particular facts and particular truths to general principles, and as it is from an approximation and comparison of related ideas that new discoveries in most instances result, the knowledge of the philosopher, even supposing that it is not more extensive, is arranged in a manner much more favorable to invention than in a mind unaccustomed to system.

How much invention depends on a proper combination of the materials of our knowledge, appears from the resources which occur to men of the lowest degree of ingenuity, when they are pressed by any alarming difficulty and danger, and from the unexpected exertions made by very ordinary characters, when called to situations which rouse their latent powers. In such cases, I take for granted, that necessity operates in producing invention, *chiefly by concentrating the attention of the mind to one set of ideas*, by leading us to view these in every light, and to combine them variously with each other. As the same idea may be connected with an infinite variety of others by different relations, it may, according to circumstances, at one time suggest one of these ideas, and at another time, a different one. When we dwell long on the same idea, we obtain all the others to which it is any way related, and thus are furnished with materials on which our powers of judgment and reasoning may be employed. The effect of the division of labor in multiplying mechanical contrivances is to be explained partly on the same principle. It limits the attention to a particular subject, and familiarizes to the mind all the possible combinations of ideas which have any relation to it.

How invention differs from wit. — These observations suggest a remarkable difference between invention and wit. The former depends, in most instances, on a combination of those ideas, which are connected by the less obvious principles of association; and it may be called forth in almost any mind by the pressure of external circumstances. The ideas which must be combined, in order to produce the latter, are chiefly such as are associated by those slighter connections, which take place when the mind is careless and disengaged. "If you have real wit," says Lord Chesterfield, "it will flow spontaneously, and you need not aim at it; for in that case, the rule of the gospel is reversed; and it will prove, seek, and you shall not find." Agreeably to this observation, wit is promoted by a certain degree of intoxication, which prevents the exercise of that attention which is necessary for invention in matters of science. Hence too it is, that those who have the reputation of wits, are commonly men confident in their own powers, who allow the train of their ideas to follow, in a great measure, its natural course, and hazard, in company, every thing, good or bad, that occurs to them. Men of modesty and taste seldom attempt wit in a promiscuous society; or if they are forced to make such an exertion, they are seldom successful. Such men, however, in the circle of their friends, to whom they can unbosom themselves without reserve, are frequently the most amusing and the most interesting of companions; as the vivacity of their wit is tempered by a correct judgment and refined manners; and as its effect is heightened by that sensibility and delicacy, with which we so rarely find it accompanied in the common intercourse of life.

When a man of wit makes an exertion to distinguish himself, his sallies are commonly too far-fetched to please. He brings his mind into a state approaching to that of the inventor, and becomes rather ingenious than witty. This is often the case with the writers whom Johnson distinguishes by the name of the metaphysical poets.

Those powers of invention, which necessity occasionally calls forth in uncultivated minds, some individuals possess habitually. The related ideas which, in the case of the former, are brought together by the slow efforts of attention and recollection, present themselves to the latter, in consequence of a more systematical arrangement of their knowledge. The instantaneousness with which such remote combinations are effected, sometimes appear so wonderful, that we are apt to ascribe it to something like inspiration; but it must be remembered, that when any subject strongly and habitually occupies the thoughts, it gives us an interest in the observation of the most trivial circumstances which we suspect to have any relation to it, however distant; and by thus rendering the common objects and occurrences which the accidents of life present to us, subservient to one particular employment of the intellectual powers, establishes in the memory a connection between our favorite pursuit, and all the materials with which experience and reflection have sup plied us for the further prosecution of it.

II. *Inventions facilitated by general rules.* — I observed, in the second place, that invention may be facilitated by *general rules*, which enable the inventor to direct the train of his thoughts into particular channels. These rules (to ascertain which ought to be one principal object of the logician) will afterwards fall under my consideration, when I come to examine those intellectual processes which are subservient to the discovery of truth. At present, I shall confine myself to a few general remarks; in stating which, I have no other aim than to show, to how great a degree invention depends on cultivation and habit, even in those sciences in which it is generally supposed that every thing depends on natural genius.

When we consider the geometrical discoveries of the ancients, in the form in which they are exhibited in the greater part of the works which have survived to our times, it is seldom possible for us to trace the steps by which they were led to their conclusions; and, indeed, the objects of this science are so unlike those of all others, that it is not unnatural for a person, when he enters on the study, to be dazzled by its novelty, and to form an exaggerated conception of the genius of those men who first brought to light such a variety of truths, so profound and so remote from the ordinary course of our speculations. We find, however, that, even at the time when the ancient analysis was unknown to the moderns, such mathematicians as had attended to the *progress* of the mind in the discovery of truth, concluded *à priori*, that the discoveries of the Greek geometers did not, at first, occur to them in the order in which they are stated in their writings. The prevailing opinion was, that they had possessed some secret method of investigation, which they carefully concealed from the world; and that they published the result of their labors in such a form, as they thought would be most likely to excite the admiration of their readers. The revival of the ancient analysis, by some late mathematicians in this country, has, in part, justified these remarks, by showing to how great a degree the inventive powers of the Greek geometers were aided by that method of investigation; and by exhibiting some striking specimens of address in the practical application of it.

The solution of *problems*, indeed, it may be said, is but one mode in which mathematical invention may be displayed. *The discovery of new truths* is what we chiefly admire in an original genius; and the method of analysis gives us no satisfaction with respect to the process by which they are obtained.

How new theorems are discovered. — To remove this difficulty completely, by explaining all the various ways in which *new theorems* may be brought to light, would lead to inquiries foreign to this work. In order, however, to render the process of the mind, on such occasions, a little less mysterious than it is commonly supposed to be; it may be proper to remark, that the most copious source of discoveries is the investigation of problems; which seldom fails (even although we should not succeed in the attainment of the object which we have in view) to exhibit to us some relations formerly unobserved among the quantities which are under consideration. Of so great importance is it to concentrate the attention to a particular subject, and to check *that wandering and dissipated habit of thought*, which, in the case of most persons, renders their speculations barren of any profit either to themselves or to others. Many theorems, too, have been suggested by *analogy;* many have been investigated from truths formerly known by *altering, or by generalizing, the hypothesis;* and many have been obtained by a species of induction. An illustration of these various processes of the mind would not only lead to new and curious remarks, but would contribute to diminish that blind admiration of original genius, which is one of the chief obstacles to the improvement of science.

Success in scientific researches depends on method. — The history of natural philosophy, before and after the time of Lord Bacon, affords another proof, how much the powers of invention and discovery may be assisted by *the study of method:* and in all the sciences, without exception, whoever employs his genius with a regular and habitual success, plainly shows, that it is by means of general rules that his inquiries are conducted. Of these rules, there may be many which the inventor never stated to himself in words; and perhaps he may even be unconscious of the assistance which he derives from them; but their influence on his genius appears unquestionably from the uniformity with which it proceeds; and in proportion as they can be ascertained by his own speculations, or collected by the logician from an examination of his researches, similar powers of invention will be placed within the reach of other men, who apply themselves to the same study.

The following remarks, which a truly philosophical artist has applied to painting, may be extended, with some trifling alterations, to all the different employments of our intellectual powers: —

"What we now call *genius* begins, not where rules, abstractedly taken, end; but where known, vulgar, and trite rules have no longer any place. It must of necessity be, that a work of genius, as well as every other effect, as it must have its cause, must likewise have its rules; it cannot be by chance, that excellences are produced with any constancy, or any certainty, for this is not the nature of chance; but the rules by which men of extraordinary parts, and such as are called men of genius, work, are either such as they discover by their own peculiar observation, or of such a nice texture as not easily to admit handling or expressing in words.

"Unsubstantial, however, as these rules may seem, and difficult as it may be to convey them in writing, they are still seen and felt in the mind of the artist; and he works from them with as much certainty, as if they were embodied, as I may say, upon paper. It is true, these refined principles cannot be always made palpable, like the more gross rules of art; yet it does not follow, but that the mind may be put in such a train, that it shall perceive, by a kind of scientific sense, that propriety which words can but very feebly suggest." — (*Discourses* by Sir Joshua Reynolds.)

V. *Application of the principles stated in the foregoing sections of this chapter, to explain the phenomena of dreaming.* — With respect to the phenomena of dreaming, three different questions may be proposed. First, What is the state of the *mind* in sleep? or, in other words, *what faculties* then continue to operate, and what faculties are then suspended? Secondly, How far do our dreams appear to be influenced by our *bodily sensations;* and in what respects do they vary, according to the different conditions of the body in health, and in sickness? Thirdly, What is the change which sleep produces on those parts of the *body*, with which our mental operations are more immediately connected; and how does this change operate, in diversifying so remarkably the phenomena which our minds then exhibit, from those of which we are conscious in our waking hours? Of these three questions, the *first* belongs to the philosophy of the human mind; and it is to this question that the following inquiry is almost entirely confined. The *second* is more particularly interesting to *the medical inquirer*, and does not properly fall under the plan of this work. The *third* seems to me to relate to a subject, which is placed *beyond the reach of the human faculties.*

It may be granted, that, if we could ascertain the state of the mind in sleep, so as to be able *to resolve the various phenomena of dreaming into a smaller number of general principles;* and still more, if we could resolve them into *one general fact*, we should be advanced a very important step in our inquiries upon this subject; even although we should find it impossible to show, in what manner this change in the state of the mind results from the change which sleep produces in the state of the body. Such a step would at least gratify, to a certain extent, that disposition of our nature which prompts us to ascend from particular facts to general laws, and which is the foundation of all our philosophical researches; and, in the present instance, I am inclined to think, that it carries us as far as our imperfect faculties enable us to proceed.

What circumstances accelerate or retard the approach of sleep.— In conducting this inquiry with respect to the state of the mind in sleep, it seems reasonable to expect, that some light may be obtained from an examination of the circumstances which accelerate or retard its approach; for when we are disposed to rest, it is natural to imagine, that the state of the mind approaches to its state in sleep more nearly, than when we feel ourselves alive and active, and capable of applying all our various faculties to their proper purposes.

In general, it may be remarked, that the approach of sleep is accelerated by every circumstance which diminishes or suspends the exercise of the mental powers; and is retarded by every thing which has a contrary tendency. When we wish for sleep, we naturally endeavor to withhold, as much as possible, all the active exertions of the mind, by disengaging our attention from every interesting subject of thought. When we are disposed to keep awake, we naturally fix our attention on some subject which is calculated to afford employment to our intellectual powers, or to rouse and exercise the active principles of our nature.

It is well known, that there is a particular class of *sounds* which compose us to sleep. The hum of bees; the murmur of a fountain; the reading of an uninteresting discourse, have this tendency in a remarkable degree. If we examine this class of sounds, we shall find that it consists wholly of such as are fitted to withdraw the attention of the mind from its own thoughts, and are, at the same time, not sufficiently interesting to engage its attention to themselves.

It is also matter of common observation, that children and persons of little reflection, who are chiefly occupied about sensible objects, and whose mental activity is, in a great measure, suspended, as soon as their perceptive powers are unemployed; find it extremely difficult to continue awake, when they are deprived of their usual engagements. The same thing has been remarked of savages, whose time, like that of the lower animals, is almost completely divided between sleep and their bodily exertions.*

The powers dependent on volition suspended during sleep.—From a consideration of these facts, it seems reasonable to conclude that in sleep those operations of the mind are suspended, which depend on our volition; for if it be certain, that before we fall asleep, we must withhold, as much as we are able, the exercise of all our different powers; it is scarcely to be imagined, that, as soon as sleep commences, these powers should again begin to be exerted. The more probable conclusion is, that when we are desirous to procure sleep, we bring both mind and body, as nearly as we can, into that state in which they are to continue after sleep commences. The difference, therefore, between the state of the mind when we are inviting sleep, and when we are actually asleep, is this, — that in the former case, although its active exertions be suspended, we can renew them, if we please. In the other case, the will loses its influence over all our powers, both of mind and body; in consequence of some physical alteration in the system, which we shall never, probably, be able to explain.

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* "The existence of the negro slaves in America, appears to participate more of sensation than reflection. To this must be ascribed, their disposition to sleep when abstracted from their diversions and unemployed in their labor. An animal whose body is at rest, and who does not reflect, must be disposed to sleep, of course."—*Notes on Virginia*, by Mr. Jefferson, p. 225.

In order to illustrate this conclusion a little further, it may be proper to remark, that if the suspension of our voluntary operations in sleep be admitted as a fact, there are only *two suppositions* which can be formed concerning its cause. *The one* is, that the power of volition is suspended; *the other*, that the will loses its influence over those faculties of the mind, and those members of the body, which, during our waking hours, are subjected to its authority. If it can be shown, then, that the former supposition is not agreeable to fact, the truth of the latter seems to follow as a necessary consequence.

1. *Volition itself not suspended during sleep.* — That the power of volition is not suspended during sleep, appears from the efforts which we are conscious of making while in that situation. We dream, for example, that we are in danger; and we attempt to call out for assistance. The attempt, indeed, is, in general, unsuccessful; and the sounds which we emit are feeble and indistinct; but this only confirms, or rather is a necessary consequence of the supposition, that, in sleep, the connection, between the will and our voluntary operations is disturbed or interrupted. The continuance of the power of volition is demonstrated by the effort, however ineffectual.

In like manner, in the course of an alarming dream, we are sometimes conscious of making an exertion to save ourselves, by flight, from an apprehended danger; but in spite of all our efforts, we continue in bed. In such cases, we commonly dream that we are attempting to escape, and are prevented by some external obstacle; but the fact seems to be, that the body is, at that time, not subject to the will. During the disturbed rest which we sometimes have when the body is indisposed, the mind appears to retain some power over it; but as, even in these cases, the motions which are made consist rather of a general agitation of the whole system, than of the regular exertion of a particular member of it, with a view to produce a certain effect; it is reasonable to conclude, that in perfectly sound sleep, the mind, although it retains the power of volition, retains no influence whatever over the bodily organs.

In that particular condition of the system, which is known by the name of *incubus*, [or *nightmare*,] we are conscious of a total want of power over the body; and, I believe, the common opinion is, that it is this want of power which distinguishes the *incubus* from all the other modifications of sleep. But the more probable supposition seems to be, that every species of sleep is accompanied with a suspension of the faculty of voluntary motion, and that the incubus has nothing peculiar in it but this, — that the uneasy sensations which are produced by the accidental posture of the body, and which we find it impossible to remove by our own efforts, render us distinctly conscious of our incapacity to move. One thing is certain, that the instant of our awaking, and of our recovering the command of our bodily organs, is one and the same.

2. The same conclusion is confirmed by a different view of the subject. It is probable, as was already observed, that when we are anxious to procure sleep, the state into which we naturally bring the mind, approaches to its state after sleep commences. Now it is manifest, that the means which nature directs us to employ on such occasions, is, *not to suspend the power of volition*, but *to suspend the exertion of those powers whose exercise depends on volition.* If it were necessary that volition should be suspended before we fall asleep, it would be impossible for us, by our own efforts to hasten the moment of rest. The very supposition of such efforts is absurd; for it implies a continued will to suspend the acts of the will.

Sleep affects the mind as it does the body. — According to the foregoing doctrine with respect to the state of the mind in sleep, the effect which is produced on our mental operations, is strikingly analogous to that which is produced on our bodily powers. From the observations which have been already made, it is manifest that in sleep, the body is, in a very inconsiderable degree, if at all, subject to our command. The vital and involuntary motions, however, suffer no interruption, but go on as when we are awake, in consequence of the operation of some cause unknown to us. In like manner, it would appear, that those operations of the mind which depend on our volition are suspended; while certain other operations are, at least, occasionally carried on. This analogy naturally suggests the idea, that *all* our mental operations, which are independent of our will, may continue during sleep; and that the phenomena of dreaming may, perhaps, be produced by these, diversified in their apparent effects, in consequence of the suspension of our voluntary powers.

If the appearances which the mind exhibits during sleep are found to be explicable on this general principle, it will possess all the evidence which the nature of the subject admits of.

How much power the will has over the thoughts.—It was formerly shown, that the train of thought in the mind does not depend *immediately* on our will, but is regulated by certain general laws of association. At the same time, it appeared, that among the various subjects which thus spontaneously present themselves to our notice, we have the power of singling out any one that we choose to consider, and of making it a particular object of attention; and that by doing so, we not only can stop the train that would otherwise have succeeded, but frequently can divert the current of our thoughts into a new channel. It also appeared, that we have a power (which may be much improved by exercise) of recalling past occurrences to the memory, by a voluntary effort of recollection.

The *indirect* influence which the mind thus possesses over the train of its thoughts is so great, that during the whole time we are awake, excepting in those cases in which we fall into what is called a revery, and suffer our thoughts to follow their natural course, the order of their succession is always regulated more or less by the will. The will, indeed, in regulating the train of thought, can operate only (as I have already shown) by availing itself of the established laws of association; but still it has the power of rendering this train very different from what it would have been, if these laws had taken place without its interference.

How dreams would differ from waking thoughts upon this theory. — From these principles, combined with the general fact which I have endeavored to establish, with respect to the state of the mind in sleep, two obvious consequences follow: *first*, that when we are in this situation, the succession of our thoughts, in so far as it depends on the laws of association, may be carried on by the operation of the same unknown causes by which it is produced while we are awake; and, *secondly*, that the *order* of our thoughts, in these two states of the mind, must be very different; inasmuch as, in the one, it depends *solely on the laws of association*, and in the other, *on these laws combined with our own voluntary exertions.*

In order to ascertain how far these conclusions are agreeable to truth, it is necessary to compare them with the known phenomena of dreaming. For which purpose, I shall endeavor to show, first, that the succession of our thoughts in sleep, is regulated by the same general laws of association, to which it is subjected while we are awake; and, secondly, that the circumstances which discriminate dreaming from our waking thoughts, are such as must necessarily arise from the suspension of the influence of the will.

I. That *the succession of our thoughts in sleep, is regulated by the same general laws of association*, which influence the mind while we are awake, appears from the following considerations.

1. Our dreams are frequently suggested to us *by bodily sensations;* and with these, it is well known, from what we experience while awake, that particular ideas are frequently very strongly associated. I have been told by a friend, that, having occasion, in consequence of an indisposition, to apply a bottle of hot water to his feet when he went to bed, he dreamed that he was making a journey to the top of Mount Ætna, and that he found the heat of the ground almost insupportable. Another person, having a blister applied to his head, dreamed that he was

scalped by a party of Indians. I believe every one who is in the habit of dreaming, will recollect instances, in his own case, of a similar nature.

2. Our dreams are influenced *by the prevailing temper of the mind;* and vary, in their complexion, according as our habitual disposition, at the time, inclines us to cheerfulness or to melancholy. Not that this observation holds without exception; but it holds so generally, as must convince us, that the state of our spirits has some effect on our dreams, as well as on our waking thoughts. Indeed, in the latter case, no less than in the former, this effect may be counteracted, or modified by various other circumstances.

After having made a narrow escape from any alarming danger, we are apt to awake, in the course of our sleep, with sudden startings; imagining that we are drowning, or on the brink of a precipice. A severe misfortune, which has affected the mind deeply, influences our dreams in a similar way; and suggests to us a variety of adventures, analogous, in some measure, to that event from which our distress arises. Such, according to Virgil, were the dreams of the forsaken Dido.

> "——— Agit ipse furentem
> In somnis ferus Æneas; semperque relinqui
> Sola sibi; semper longam incomitata videtur
> Ire viam, et Tyrios desertâ quærere terrâ."

3. Our dreams are influenced *by our prevailing habits of association* while awake.

In a former part of this work, I considered the extent of that power which the mind may acquire over the train of its thoughts; and I observed, that those intellectual diversities among men, which we commonly refer to peculiarities of genius, are, at least in a great measure, resolvable into differences in their habits of association. One man possesses a rich and beautiful fancy, which is at all times obedient to his will. Another possesses a quickness of recollection, which enables him, at a moment's warning, to bring together all the results of his past experience, and of his past reflections, which can be of use for illustrating any proposed subject. A third can, without effort, collect his attention to the most abstract questions in philosophy; can perceive, at a glance, the shortest and the most effectual process for arriving at the truth; and can banish from his mind every extraneous idea, which fancy or casual association may suggest, to distract his thoughts or to mislead his judgment. A fourth unites all these powers in a capacity of perceiving truth with an almost intuitive rapidity; and in an eloquence which enables him to command, at pleasure, whatever his memory and his fancy can supply, to illustrate and to adorn it. The occasional exercise which such men make of their powers, may undoubtedly be said, in one sense, to be unpremeditated or unstudied; but they all indicate previous *habits* of meditation or study, as unquestionably as the dexterity of the expert accountant, or the rapid execution of the professional musician.

From what has been said, it is evident, that a train of thought which, in one man, would require a painful effort of study, may, in another, be almost spontaneous; nor is it to be doubted that the reveries of studious men, even when they allow, as much as they can, their thoughts to follow their own course, are more or less connected together by those principles of association, which their favorite pursuits tend more particularly to strengthen.

The influence of the same habits may be traced distinctly in sleep. There are probably few mathematicians, who have not dreamed of an interesting problem, and who have not even fancied that they were prosecuting the investigation of it with much success. They whose ambition leads them to the study of eloquence, are frequently conscious, during sleep, of a renewal of their daily occupations; and sometimes feel themselves possessed of a fluency of speech, which they never experienced before. The poet, in his dreams, is transported into Elysium, and leaves the vulgar and unsatisfactory enjoyments of humanity, to dwell in those regions of enchantment and rapture, which have been created by the divine imaginations of Virgil and of Tasso.

"And hither Morpheus sent his kindest dreams,
Raising a world of gayer tinct and grace;
O'er which were shadowy cast Elysian gleams,
That play'd, in waving lights, from place to place,
And shed a roseate smile on Nature's face.
Not Titian's pencil e'er could so array,
So fleece with clouds the pure ethereal space;
Nor could it e'er such melting forms display,
As loose on flowery beds all languishingly lay.
No, fair illusions! artful phantoms, no!
My muse will not attempt your fairy land:
She has no colors, that like yours can glow;
To catch your vivid scenes, too gross her hand." —
Castle of Indolence.

As a further proof that the succession of our thoughts in dreaming, is influenced by our prevailing habits of association, it may be remarked, that the scenes and occurrences which most frequently present themselves to the mind while we are asleep, are *the scenes and occurrences of childhood and early youth.* The facility of association is then much greater than in more advanced years; and although, during the day, the memory of the events thus associated may be banished by the objects and pursuits which press upon our senses, it retains a more permanent hold of the mind than any of our subsequent acquisitions; and like the knowledge which we possess of our mother tongue, is, as it were, interwoven and incorporated with all its most essential habits. Accordingly, in old men, whose thoughts are, in a great measure, disengaged from the world, the transactions of their middle age, which once seemed so important, are often obliterated; while the mind dwells, as in a dream, on the spots and the companions of their infancy.

I shall only observe further, on this head, that in our dreams, as well as when awake, we occasionally make use of words as an instrument of thought. Such dreams, however, do not affect the mind with such emotions of pleasure and of pain, as those in which the imagination is occupied with particular objects of sense. The effect of philosophical studies, in habituating the mind to the almost constant employment of this instrument, and, of consequence, its effect in weakening the imagination, was formerly remarked. If I am not mistaken, the influence of these circumstances may also be traced in the history of our dreams; which, in youth, commonly involve, in a much greater degree, the exercise of imagination; and affect the mind with much more powerful emotions, than when we begin to employ our maturer faculties in more general and abstract speculations.

II. From these different observations, we are authorized to conclude, that the same laws of association which regulate the train of our thoughts while we are awake, continue to operate during sleep. I now proceed to consider, how far *the circumstances which discriminate dreaming from our waking thoughts* correspond with those which might be expected to result from the suspension of the influence of the will.

1. If the influence of the will be suspended during sleep, all our *voluntary operations*, such as recollection, reasoning, etc., must also be suspended.

That this really is the case, the extravagance and inconsistency of our dreams are sufficient proofs. We frequently confound together times and places the most remote from each other; and in the course of the same dream, conceive the same person as existing in different parts of the world. Sometimes we imagine ourselves conversing with a dead friend, without remembering the circumstance of his death, although, perhaps, it happened but a few days before, and affected us deeply. All this proves clearly, that the subjects which then occupy our thoughts are such as present themselves to the mind spontaneously; and that we have no power of employing our reason in comparing together the different parts of our dreams; or even of exerting an act of recollection in order to ascertain how far they are consistent and possible.

The process of reasoning in which we sometimes fancy ourselves to be engaged during sleep, furnish no exception to the foregoing observation; for, although every such process, the first time we form it, implies volition; and, in particular, implies a recollection of the premises, till we arrive at the conclusion; yet, when a number of truths have been often presented to us as necessarily connected with each other, this series may after wards pass through the mind, according to the laws of association, without any more activity on our part, than in those trains of thought which are the most loose and incoherent. Nor is this mere theory. I may venture to appeal to the consciousness of every man accustomed to dream, whether his reasonings during sleep do not seem to be carried on without any exertion of his will; and with a degree of facility of which he was never conscious while awake. Mr, Addison, in one of his Spectators, has made this observation; and his testimony, in the present instance, is of the greater weight, that he had no particular theory on the subject to support. "There is not," says he, "a more painful action of the mind than invention; yet in dreams it works with that ease and activity, that we are not sensible when the faculty is employed. For instance, I believe every one, some time or other, dreams that he is reading papers, books, or letters; in which case the invention prompts so readily that the mind is imposed on, and mistakes its own suggestions for the composition of another."

2. If the influence of the will during sleep be suspended, *the mind will remain as passive*, while its thoughts change from one subject to another, as it does during our waking hours, while different perceptible objects are presented to our senses.

Of this passive state of the mind in our dreams it is unnecessary to multiply proofs; as it has always been considered as one of the most extraordinary circumstances with which they are accompanied. If our dreams, as well as our waking thoughts were subject to the will, is it not natural to conclude, that in the one case, as well as in the other, we would endeavor to banish, as much as we could, every idea which had a tendency to disturb us; and detain those only which we found to be agreeable? So far, however, is this power over our thoughts from being exercised, that we are frequently oppressed, in spite of all our efforts to the contrary, with dreams which affect us with the most painful emotions. And, indeed, it is matter of vulgar remark, that *our dreams are*, in every case, *involuntary* on our part, and that they appear to be obtruded on us by some external cause. This fact appeared so unaccountable to the late Mr.

Baxter, that it gave rise to his very whimsical theory, in which he ascribes dreams to the immediate influence of separate spirits on the mind.

3. If the influence of the will be suspended during sleep, the *conceptions* which we then form of sensible objects will be attended with a belief of their real existence, as much as the *perception* of the same objects is while we are awake.

In treating of the power of conception, I formerly observed, that our belief of the separate and independent existence of the objects of our perceptions, is the result of experience; which teaches us that these perceptions do not depend on our will. If I open my eyes, I cannot prevent myself from seeing the prospect before me. The case is different with respect to our conceptions. While they occupy the mind, to the exclusion of every thing else, I endeavored to show, that they are always accompanied with belief: but as we can banish them from the mind, during our waking hours, at pleasure; and as the momentary belief which they produce, is continually checked by the surrounding objects of our perceptions, we learn to consider them as fictions of our own creation; and, excepting in some accidental cases, pay no regard to them in the conduct of life. If the doctrine, however, formerly stated with respect to conception be just, and if, at the same time, it be allowed, that sleep suspends the influence of the will over the train of our thoughts, we should naturally be led to expect, that the same belief which accompanies conception while we are awake, should accompany the perceptions which occur to us in our dreams. It is scarcely necessary for me to remark, how strikingly this conclusion coincides with acknowledged facts.

May it not be considered as some confirmation of the foregoing doctrine, that when opium fails in producing complete sleep, it commonly produces *one* of the effects of sleep, by suspending the activity of the mind, and throwing it into a revery; and that while we are in this state, our conceptions frequently affect us nearly in the same manner, as if the objects conceived were present to our senses? — (See the Baron de Tott's Account of the Opium-takers at Constantinople.)

Another circumstance with respect to our conceptions during sleep, deserves our notice. As the subjects which we then think upon occupy the mind exclusively; and as the attention is not diverted by the objects of our external senses, *our conceptions must be proportionably lively and steady.* Every person knows how faint the conception is which we form of any thing, with our eyes open, in comparison of what we can form with our eyes shut; and that, in proportion as we can suspend the exercise of all our other senses, the liveliness of our conception increases. To this cause is to be ascribed, in part, the effect which the dread of spirits in the dark has on some persons, who are fully convinced in speculation that their apprehensions are groundless; and to this, also, is owing the effect of any accidental perception in giving them a momentary relief from their terrors. Hence the remedy which nature points out to us, when we find ourselves overpowered by imagination. If every thing around us be silent, we endeavor to create a noise by speaking aloud, or beating with our feet; that is, we strive to divert the attention from the subjects of our imagination, by presenting an object to our powers of perception. The conclusion which I draw from these observations is, that as there is no state of the body in which our perceptive powers are so totally unemployed as in sleep, it is natural to think that the objects which we conceive or imagine, must then make an impression on the mind beyond comparison greater than any thing of which we can have experience while awake.

From these principles may be derived a simple, and, I think, a satisfactory, explanation of what some writers have represented as the most mysterious of all the circumstances connected with dreaming; *the inaccurate estimates we are apt to form of time*, while we are thus employed; — an inaccuracy which sometimes extends so far, as to give to a single instant the appearance of hours, or perhaps of days. A sudden noise, for example, suggests a dream connected with that perception; and, the moment afterwards, this noise has the effect of awaking us; and yet, during that momentary interval, a long series of circumstances has passed before the imagination. The story quoted by Mr. Addison, (Spectator, No. 94,) from the Turkish Tales, of the miracle wrought by a Mahometan doctor to convince an infidel sultan, is, in such cases, nearly verified.

The facts I allude to at present are generally explained by supposing, that, in our dreams, the rapidity of thought is greater than while we are awake; but there is no necessity for having recourse to such a supposition. The rapidity of thought is, at all times, such, that in the twinkling of an eye a crowd of ideas may pass before us, to which it would require a long discourse to give utterance; and transactions may be conceived, which it would require days to realize. But, in sleep, the conceptions of the mind are mistaken for realities; and therefore our estimates of time will be formed, not according to our experience of the rapidity of thought, but according to our experience of the time requisite for realizing what we conceive. Something perfectly analogous to this may be remarked in the perceptions we obtain by the sense of sight. When I look into a show-box, where the deception is imperfect, I see only a set of paltry daubings of a few inches diameter; but if the representation be executed with so much skill, as to convey to me the idea of a distant prospect, every object before me swells in its dimensions, in proportion to the extent of space which I conceive it to occupy; and what seemed before to be shut up within the limits of a small wooden frame, is magnified, in my apprehension, to an immense landscape of woods, rivers, and mountains.

The phenomena of partial sleep.— The phenomena which we have hitherto explained, take place when sleep seems to be complete; that is, when the mind loses its influence over *all* those powers whose exercise depends on its will. There are, however, many cases in which sleep seems to be partial; that is, when the mind loses its influence over *some* powers, and retains it over others. In the case of the *somnambuli*, it retains its power over the limbs, but it possesses no influence over its own thoughts, and scarcely any over the body; excepting those particular members of it which are employed in walking. In *madness*, the power of the will over the body remains undiminished, while its influence in regulating the train of thought is in a great measure suspended; either in consequence of a particular idea, which engrosses the attention, to the exclusion of every thing else, and which we find it impossible to banish by our efforts; or in consequence of our thoughts succeeding each other with such rapidity, that we are unable to stop the train. In both of these kinds of madness, it is worthy of remark, that the conceptions or imaginations of the mind becoming independent of our will, they are apt to be mistaken for actual perceptions, and to affect us in the same manner.*

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* [About ten years ago, the editor of this volume attempted to extend to the case of *insanity* the hypothesis which Stewart has here so pleasingly expounded in relation to *dreaming*. The following is the substance of the remarks, which, in the execution of this purpose, were then published in a periodical work.

It seems to us, that the most characteristic trait of insanity is a loss of the indirect controlling power which the *will* usually exercises over the propensities and the processes of the *understanding*. We call this power *indirect*, because the will cannot immediately govern the belief, or the succession of ideas, so as to give distinctness to an imperfect recollection, or to put aside an unpleasant thought. But it can *indirectly* labor to these ends, and human reason differs from brute instinct in no respect so much as in this sovereignty, partial though it be, which the will and the conscience exercise over the swift currents of the thoughts, and the impulse of the desires. This is chiefly done through the faculty of attention, which is directly dependent on the will. We can stay the succession of ideas at any instant, in order to dwell upon a selected thought, till we have considered it in all its parts and relations. Comparison itself has been rightly defined as an act of *alternate attention* to two objects; and it is therefore impaired or lost only when we cease to have command of the attention, because the will in this respect has become powerless. We distinguish fancies from realities only by an effort of attention to our sensations, which manifest the difference between the imaginary and the true. If circumstances prevent us from making this effort, we live in an unreal world, heedless and unconscious of external things. The same relaxation of the power of the will, by which mental phenomena are converted into real existences, removes all control and guidance from the thoughts, which then become confused and incoherent, a mere stream of inconsistent fancies. It is so in dreams; every sleeper is a madman, and would appear as such, if the will did not lose its power *over the body also*, so that action no longer manifests the delusions of the intellect. In the case of somnambulism, the muscles remain subject to the volitions of the sleeper, By means of this supposition of a partial sleep, any apparent exceptions which the history of dreams may afford to the

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while the mind is under no control. The somnambulist is, therefore, really insane, and, as such, the law does not hold him responsible for his deeds. To remove the check which the will has over the thoughts is like taking away the balance-wheel from a watch, which then runs down with a hurried and irregular motion, no longer taking note of time. Every thinker perceives this effect, if he abandons himself to a fit of reverie, when the most heterogeneous ideas chase each other in quick succession through the mind, without coherency or method, and leaving hardly a trace on the memory. Startle him from this state of dreamy abstraction, and he looks round bewildered, and requires a moment of effort, before he becomes conscious of his situation, and of the presence of surrounding things. Except the depression of spirits, he feels, for an instant, as Lear did, when wakening to a gleam of sanity, as the clouds which had obscured his intellect were for a moment parted. How admirably are the bewilderment of mind, and the effort to recall and fix the attention upon the bystanders, here depicted! It is the struggle of the will to regain its supremacy.

"Pray, do not mock me:
I am a very foolish, fond old man,
Fourscore and upward; and, to deal plainly,
I fear I am not in my perfect mind.
Methinks I should know you, and know this man;
Yet I am doubtful: for I am mainly ignorant
What place this is; and all the skill I have
Remembers not these garments; nor I know not
Where I did lodge last night. Do not laugh at me;
For, as I am a man, I think this lady
To be my child Cordelia."

In most cases of recovery, the patient retains no memory of what has occurred, or what he has done during his madness; or, if any recollection remains, it is dim and perturbed, like that of a dream. Memory being dependent on attention, and that again on the will, this is precisely what we should expect when the power of volition is suspended. In cases of partial mania, the will loses its control over a particular thought, or set of ideas, which then occupy and harass the mind, being invested with a factitious importance, and leading to the most insane acts. A sane person, if an unpleasant thought or recollection comes upon him, can resolutely put it aside, and fix his attention upon other objects. But if he be nervous and imaginative, irresolute of will, and defective in the power of attention, the unwelcome visitant — especially if it be of a gloomy or exciting character, general principles already stated, admit of an easy explanation.

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like the recollection of a calamity, a disappointment, or an insult — usurps almost exclusive possession of the mind, and he sinks into habitual despondency. Every moment then increases his danger; and unless some counteracting cause, like the necessity for exertion, be applied, the train of thought at last entirely shakes off the sovereignty of the will, and the man becomes a monomaniac.

The particular character of the delusion will be determined by the patient's former prevailing turn of mind, and by the chief emotions to which he was subject. A man's character is not altered by an attack of insanity; it is only developed and exposed, the check which was usually imposed on its free manifestations being now taken away. A person of sound mind soon learns to control his desires and propensities, from a regard to the opinions or the rights of others. His irascibility is repressed, his estimation of himself is carefully concealed, his lower appetites are governed, and he maintains that reserved and staid demeanor, through which only a penetrating eye, and observation sharpened by long experience, can detect the innate peculiarities of his disposition. This lesson of self-control is learned at so early a period, and is practised upon so habitually, that one is hardly conscious of effort in submitting to it, unless the primitive desires are of extraordinary force. Let the power of the will be destroyed by an attack of mental disease, and this veil is removed; the passions run riot, the leading emotion betrays itself in the grossest manner, and the sufferer appears like another being, even to his most intimate friends.

The love of power, and an inordinate estimate of self, are among the most common infirmities of human nature; and nowhere are they so strikingly exhibited, though in a ludicrous light, as among the inmates of a lunatic asylum. Here comes a king of shreds and patches, with a paper crown on his head, and bits of tinsel showily disposed about his person, who announces himself as the Prince of Wales and emperor of the world, and greets his visitor with the utmost condescension, as he would a subject who had come to do him homage. But he suddenly breaks off in the midst of a pompous speech, to inform you, that he has just had a contest with the devil in that apartment, and had broken two of his ribs, — this devil being an unfortunate keeper, to whose face he had taken a dislike, and whose bones he had actually broken. The walls of his room are scribbled all over, chiefly with the lofty titles of his greatness; as, "Supreme from the Almighty," "Mighty Prince," "Mighty General-in-Chief," "Great Mighty Grand Admiral," and the like.* Another of the company

* Conolly *on Insanity*, p. 289.

Upon reviewing the foregoing observations, it does not occur to me that I have in any instance transgressed those rules of

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is a poor, mad author, who, in one hour, has written an epic, embracing the universal history of Greece and Rome ; has restored the Iliad to its state as it came from the genius of Kanki, who lived many millions of ages before the deluge of Ogyges; and accounts for his wonderful endowments, by saying that he is a son of Jupiter and Juno. Scott has given us an admirable portrait of a deranged female, whose brainsick fancies are only the foibles of the weaker part of her sex, grossly exaggerated, and displayed without the least reserve. Madge Wildfire is insane from an excessive love of admiration, and an insatiable desire to dazzle and captivate; and in all her ravings, her simpering manner, her fantastic costume, and bits of finery, we see only the ruling passion divested of any covering or control.

The strange jumble of fancies, which a distracted person exhibits, seems to be only the perfectly loose and casual succession of ideas in a mind which has emancipated itself from the governing power of the will. It is precisely the incoherency of a dream, when the thoughts ramble on without any restraint from volition, or any voluntary pause for the exercise of judgment. The utterly passive intellect merely reflects like a mirror the images that float before it, without receiving any impression from them, or preserving any trace of their passage. Outward objects have no longer their usual power to check the current of loose thoughts, and recall the mind to a consciousness of its situation; the sleeper does not see them, and the insane person, from the defect in his will, can pay no attention to them. The dream of the madman lasts longer; but in every other respect, it is like the night-visions of the perfectly healthy intellect. He has the command of his limbs, also; but he walks in his sleep, and has as little perception of external things as the common somnambulist.

The application of this theory to the cases of moral idiocy and impulsive insanity may be easily made. Our position is, that mental disease is nothing more than the suspension of the ordinary power of the will over the other powers of the mind. The thoughts and actions then become entirely irrational, not because reason and judgment, properly speaking, cease to exist, but because they are both acts consequent upon attention, and, of course, cannot manifest themselves when the attention is no longer under control. These noble faculties, then, neither decay nor are subject to disease; they are simply suspended from the exercise of their functions, by the impairment of another power which is a prerequisite to their use; and when the madman's sleep is ended, they revive and perform their accustomed office. In the same way, the loss of power in the will suspends the exercise of the moral faculty. In moral mania, the conscience "is not dead, but sleepeth." The desires and propensities then exist with no more than their usual force; but they are entirely free from restraint by philosophizing which, since the time of Newton, are commonly appealed to, as the tests of sound investigation. For, in the first place, I have not supposed any causes which are not known to exist; and, secondly, I have shown, that the phenomena under our consideration are necessary consequences of the causes to which I have referred them. I have not supposed that the mind acquires in sleep any new faculty of which we are not conscious while awake; but only (what we know to be a fact) that it retains some of its powers, while the exercise of others is suspended; and I have deduced synthetically the known phenomena of dreaming, from the operation of a particular class of our faculties, uncorrected by the operation of another. I flatter myself, therefore, that this inquiry will not only throw some light on the state of the mind in sleep; but that it will have a tendency to illustrate the mutual adaptation and subserviency which exist among the different parts of our constitution, when we are in complete possession of all the faculties and principles which belong to our nature.*

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the will. All the active principles of our nature then reign unchecked, and one is quite as likely to be governed by the more noble, as by the more debasing, among their number. In an instance described by Pinel, brutal and violent as were most of the actions of the young man, we learn that he readily gave way, at times, to motions of beneficence and compassion. He was literally the creature of his impulses, and blindly followed them, whether they pointed to good or evil. His condition, then, was very like that of other maniacs, who are commonly said to be subject to insane impulses; only, in his case, the will seemed to be absolutely bereft of its rightful authority over the passions, while in theirs, it is powerless only at intervals, or under particular excitement. Strictly speaking, the *impulse* is not a mark of insanity, nor unusual in its character. The thought of killing may frequently enter the mind of a passionate, but perfectly sane, person; but it is instantly put aside, as an idle or wicked fancy, by the conscience. The will masters such vague but horrible thoughts, almost without the consciousness of effort. But as the gradual approach of disease weakens its command over the succession of ideas, the devilish thought intrudes more frequently, and will not "down at his bidding." An air-drawn dagger becomes visible to the "heat-oppressed brain," and the patient clutches the real weapon at last, in what is, for the moment, an uncontrollable frenzy.]

* Soon after the publication of the first edition of this work, a difficulty

PART II.

OF THE INFLUENCE OF ASSOCIATION ON THE INTELLECTUAL AND ON THE ACTIVE POWERS.

I. *Of the influence of casual associations on our speculative conclusions.* — The association of ideas has a tendency to warp our speculative opinions chiefly in the three following ways: —

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was started to me with respect to my conclusions concerning the state of the mind in sleep, by my excellent friend M. Prévost, of Geneva; a gentleman who has long held a high rank in the republic of letters, and to whose valuable correspondence I have often been indebted for much pleasure and instruction. The same difficulty was proposed to me, nearly about the same time, by another friend, [Dr. Thomas Brown,] then at a very early period of life, who has since honorably distinguished himself by his observations on Dr. Darwin's Zoonomia; the first fruits of a philosophical genius, which, I trust, is destined for yet more important undertakings."

As M. Prévost has, in the present instance, kindly aided me in the task of removing his own objection, I shall take the liberty to borrow his words.

[" Without the action of the will, there can be no effort of attention; without some effort of attention, there can be no memory. Now, in sleep, the action of the will is suspended. How, then, can there be any recollection of dreams?

" I see there are two or three solutions of this difficulty; for the present, they are reduced to this observation, either that in perfect sleep there is no recollection, and when we do recollect, that our sleep was not perfect; or that the action of the will which is sufficient for memory, is not suspended during sleep, — that this degree of activity remains to the mind, being, as it were, an elementary and almost imperceptible volition."]

I am abundantly sensible of the force of this objection; and am far from being satisfied, that it is in my power to reconcile completely the apparent inconsistency. The general conclusions, at the same time, to which I have been led, seem to result so necessarily from the facts I have stated, that even although the difficulty in question should remain for the present unsolved, it would not, in my opinion, materially affect the evidence on which they rest. In all our inquiries, it is of consequence to remember, that when we have once arrived at a general principle by a careful induction, we are not entitled to reject it, because we may find ourselves unable to explain from it, synthetically, all the phenomena in which it is concerned. The New-

First, by blending together in our apprehensions things which are really distinct in their nature; so as to introduce perplexity and error into every process of reasoning in which they are involved.

Secondly, by misleading us in those anticipations of the future from the past, which our constitution disposes us to form, and which are the great foundation of our conduct in life.

Thirdly, by connecting in the mind erroneous opinions with truths which irresistibly command our assent, and which we feel to be of importance to human happiness.

A short illustration of these remarks will throw light on the origin of various prejudices; and may, perhaps, suggest some practical hints with respect to the conduct of the understanding.

1. *Association often blends together things which are really distinct.* — I formerly had occasion to mention several instances of very intimate associations formed between two ideas which have no necessary connection with each other. One of the most remarkable is, that which exists in every person's mind between the notions of *color* and of *extension*. The former of these words expresses (at least in the sense in which we commonly employ it) *a sensation in the mind;* the latter denotes *a quality of an external object;* so that there is, in fact, no more connection between the two notions than between those of pain and of solidity;* and yet, in consequence of our always perceiving

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tonian theory of the tides is not the less certain, that some apparent exceptions occur to it, of which it is not easy (in consequence of our imperfect knowledge of the local circumstances by which, in particular cases, the effect is modified) to give a satisfactory explanation.

Of the solutions suggested by M. Prévost, the first coincides most nearly with my own opinion; and it approaches to what I have hinted (in page 202 of this work) concerning the seeming exceptions to my doctrine, which may occur in those cases where *sleep is partial.* A strong confirmation of it, undoubtedly, may be derived from the experience of those persons, (several of whom I have happened to meet with,) who never recollect to have dreamed, excepting when the soundness of their sleep was disturbed by some derangement in their general health, or by some accident which excited a bodily sensation.

* Dr. Reid has, with great truth, observed, that Des Cartes' reasonings against the existence of the secondary qualities of matter, owe all their

extension, at the same time at which the sensation of color is excited in the mind, we find it impossible to think of that sensation, without conceiving extension along with it.

Another intimate association is formed in every mind between the ideas of *space* and of *time*. When we think of an interval of duration, we always conceive it as something analogous to a

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plausibility to the ambiguity of words. When he affirms, for example, that the smell of a rose is not in the flower, but in the mind, his proposition amounts only to this, that the rose is not conscious of the sensation of smell; but it does not follow from Des Cartes' reasonings, that there is no quality in the rose which excites the sensation of smell in the mind;—which is all that any person means when he speaks of the smell of that flower. For the word smell, like the names of all secondary qualities, signifies *two things,* a sensation in the mind, and the unknown quality which fits it to excite that sensation. The same remark applies to that process of reasoning by which Des Cartes attempts to prove that there is no heat in the fire.

All this, I think, will be readily allowed with respect to smells and tastes, and also with respect to heat and cold; concerning which, I agree with Dr. Reid, in thinking that Des Cartes' doctrine, when cleared of that air of mystery which it derives from the ambiguity of words, differs very little, if at all, from the commonly received notions. But the case seems to be different with respect to *colors,* of the nature of which the vulgar are apt to form a very confused conception, which the philosophy of Des Cartes has a tendency to correct. Dr. Reid has justly distinguished *the quality* of color from what he calls *the appearance* of color, which last can only exist in a mind. Now I am disposed to believe, that when the vulgar speak of *color,* they commonly mean *the appearance of color;* or rather they associate the appearance and its cause so intimately together, that they find it impossible to think of them separately. The sensation of color never forms one simple object of attention to the mind, like those of smell and taste; but every time we are conscious of it, we perceive at the same time extension and figure. Hence it is, that we find it impossible to conceive color without extension, though certainly there is no more necessary connection between them, than between extension and smell.

From this habit of associating the two together, we are led also to assign them the same place, and to conceive the different colors, or, to use Dr. Reid's language, the appearance of the different colors, as something spread over the surfaces of bodies. I own, that when we reflect on the subject with attention, we find this conception to be indistinct, and see clearly that the appearance of color can exist only in a mind; but still it is some confused notion of this sort, which every man is disposed to form line, and we apply the same language to both subjects. We speak of a *long* and *short time*, as well as of a *long* and *short distance;* and we are not conscious of any metaphor in doing so. Nay, so very perfect does the analogy appear to us, that Boscovich mentions it as a curious circumstance, that extension should have *three* dimensions, and duration only *one.*

This apprehended analogy seems to be founded wholly on an association between the ideas of space and of time, arising from our always measuring the one of these quantities by the other. We measure *time* by *motion*, and *motion* by *extension.* In an hour, the hand of the clock moves over a certain space; in two hours, over double the space; and so on. Hence the ideas of space and of time become very intimately united, and we apply to the latter the words *long* and *short*, *before* and *after*, in the same manner as to the former.

The apprehended analogy between the relation which the different notes in the scale of music bear to each other, and the relation of superiority and inferiority, in respect of position, among material objects, arises also from an accidental association of ideas.

What this association is founded upon, I shall not take upon me to determine; but that it is the effect of accident, appears clearly from this, that it has not only been confined to particular

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who has not been very familiarly conversant with philosophical inquiries. — I find, at least, that such is the notion which most readily presents itself to my own mind.

Nor is this reference of the sensation, or appearance, of color to an external object, a fact altogether singular in our constitution. It is extremely analogous to the reference, which we always make, of the sensations of touch to those parts of the body where the exciting causes of the sensations exist. If I strike my hand against a hard object, I naturally say, that I feel pain in my hand. The philosophical truth is, that I perceive the cause of the pain to be applied to that part of my body. The sensation itself I cannot refer, in point of place, to the hand, without conceiving the soul to be spread over the body by diffusion.

A still more striking analogy to the fact under our consideration, occurs in those sensations of touch which we refer to a place beyond the limits of the body; as in the case of pain felt in an amputated limb.

ages and nations, but is the very reverse of an association which was once equally prevalent. It is observed by Dr. Gregory, in the preface to his edition of Euclid's works, that the more ancient of the Greek writers looked upon *grave* sounds as *high*, and *acute* ones as *low;* and that the present mode of expression on that subject was an innovation introduced at a later period.*

In the instances which have now been mentioned, our habits of combining the notions of two things become so strong, that we find it impossible to think of the one, without thinking at the same time of the other. Various other examples of the same species of combination, although, perhaps, not altogether so striking in degree, might easily be collected from the subjects about which our metaphysical speculations are employed. The *sensations*, for instance, which are excited in the mind by external objects, and the *perceptions* of material qualities which follow these sensations, are to be distinguished from each other only by long habits of patient reflection. A clear conception of this distinction may be regarded as the key to all Dr. Reid's reasonings concerning the process of nature in perception; and till it has once been rendered familiar to the reader, a great part of his writings must appear unsatisfactory and obscure. In truth, our progress in the philosophy of the human mind depends much more on that severe and discriminating judgment, which enables us to separate ideas which nature or habit have immediately combined, than on acuteness of reasoning or fertility of invention. And hence it is, that metaphysical studies are the best of all preparations for those philosophical pursuits which relate to the conduct of life. In none of these, do we meet with casual combinations so intimate and indissoluble as those which occur in metaphysics; and he who has been accustomed to such discriminations as this science requires, will not easily be imposed on by that confusion of ideas, which warps the judgments of the multitude in moral, religious, and political inquiries.

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* The association to which, in modern times, we are habituated from our infancy, between the ideas of acute and high, and between those of grave and low, is accounted for by Dr. Smith, in his Harmonics, from the formation of the voice in singing; [the deep or grave sounds appearing to come from the lower part of the throat, and the acute or sharp notes from above.]

Dr. Beattie, in his ingenious essay on poetry and music, says it is probable that the deepest or gravest sound was called *summa* by the Romans, and the shrillest or acutest *ima;* and he conjectures, that "this might have been owing to the construction of their instruments; the string that sounded the former being perhaps highest in place, and that which sounded the latter lowest." If this conjecture could be verified, it would afford a proof from the fact, how liable the mind is to be influenced in this respect by casual combinations.

From the facts which have now been stated, it is easy to conceive the manner in which *the association of ideas has a tendency to mislead the judgment* in the *first* of the three cases already enumerated. When two subjects of thought are so intimately connected together in the mind, that we find it scarcely possible to consider them apart, it must require no common efforts of attention, to conduct any process of reasoning which relates to either. I formerly took notice of the errors to which we are exposed in consequence of the ambiguity of *words;* and of the necessity of frequent checking and correcting our general reasonings by means of particular examples; but in the cases to which I allude at present, there is (if I may use the expression) an ambiguity of *things;* so that, even when the mind is occupied about particulars, it finds it difficult to separate the proper objects of its attention from others with which it has been long accustomed to blend them. The cases, indeed, in which such obstinate and invincible associations are formed among different subjects of thought, are not very numerous, and occur chiefly in our metaphysical researches; but in every mind, casual combinations of an inferior degree of strength, have an habitual effect in disturbing the intellectual powers, and are not to be conquered without persevering exertions, of which few men are capable. The obvious effects which this tendency to combination produces on the judgment, in confounding together those ideas which it is the province of the metaphysician to distinguish, sufficiently illustrate the mode of its operation in those numerous instances, in which its influence, though not so complete and striking, is equally real, and far more dangerous.

2. *Association misleads us in judging of the future from the past.* — The association of ideas is a source of speculative error, by misleading us in those anticipations of the future from the past, which are the foundation of our conduct in life.

The great object of philosophy, as I have already remarked more than once, is *to ascertain the laws* * *which regulate the succession of events, both in the physical and moral worlds;* in order that, when called upon to act in any particular combination of circumstances, we may be enabled to anticipate the probable course of nature from our past experience, and to regulate our conduct accordingly.

As a knowledge of the established connections among events is the foundation of sagacity and of skill, both in the practical arts, and in the conduct of life, nature has not only given to all men a strong disposition to remark, with attention and curiosity, those phenomena which have been observed to happen nearly at the same time; but has beautifully adapted to the uniformity of her own operations, the laws of association in the human mind. By rendering *contiguity in time* one of the strongest of our associating principles, she has conjoined together in our thoughts the same events which we have found conjoined in our experience, and has thus accommodated (without any effort on our part) the order of our ideas to that scene in which we are destined to act.†

The degree of experience which is necessary for the preservation of our animal existence, is acquired by all men without any particular efforts of study. The laws of nature, which it is most material for us to know, are exposed to the immediate observation of our senses; and establish, by means of the principle of association, a corresponding order in our thoughts, long before the dawn of reason and reflection; or at least, long before that period of childhood, to which our recollection afterwards extends.

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* See note to page 6.

† [" The law of the *association of ideas*, which is the regulative principle of *memory*, corresponds so exactly with the *uniform succession of cause and effect*, which is the regulative principle of the universe, that no one can doubt that the one was specially designed to be the complement of the other. The child associates the idea of burning with that of the fire; and every pleasant or painful feeling reminds him of the occasion when it was first excited. On these connections of thought, the whole value of experience depends. If memory acted disorderly, the effect, for all practical

This tendency of the mind to associate together events which have been presented to it nearly at the same time, although, on the whole, it is attended with infinite advantages, yet like many other principles of our nature, may occasionally be a source of inconvenience, unless we avail ourselves of our reason and of our experience in keeping it under proper regulation. Among the various phenomena which are continually passing before us, there is a great proportion, *whose vicinity in time does not indicate a constancy of conjunction;* and unless we be careful to make the distinction between these two classes of connections, the order of our ideas will be apt to correspond with the one as well as with the other; and our unenlightened experience of the past will fill the mind, in numberless instances, with vain expectations, or with groundless alarms, concerning the future. This disposition to confound together accidental and permanent connections, is one great source of popular superstitions. Hence the regard which is paid to unlucky days; to unlucky colors; and to the influence of the planets; — apprehensions which render human life, to many, a continued series of absurd terrors. Lucretius compares them to those which children feel, from an idea of the existence of spirits in the dark.

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purposes, would be the same as if events succeeded each other at random, and not in an unchangeable sequence. Before the past can be a safe guide as to the future, it is necessary, not only that the same effect should always follow the same cause, but also that the sight of the cause should always and instantly remind us of what is sure to succeed. In this respect, as in many others, the mind is a microcosm; it mirrors to us those aspects of external nature which are most necessary to be presented for the safety of the individual. The law of causation is also the law of memory."] — Bowen's *Lowell Lectures*, p. 398.

"Ac veluti pueri trepidant, atque omnia cæcis
In tenebris metuunt, sic nos in luce timemus,
Interdum nihilo quæ sunt metuenda magis."

Such spectres can be dispelled by the light of philosophy only; which, by accustoming us to trace established connections, teaches us to despise those which are casual; and, by giving a proper direction to that bias of the mind which is the foundation of superstition, prevents it from leading us astray.

Wrong associations may mislead even enlightened minds. — In the instances which we have now been considering, events come to be combined together in the mind, merely from the accidental circumstance of their contiguity in time, at the moment when we perceived them. Such combinations are confined, in a great measure, to uncultivated and unenlightened minds; or to those individuals who, from nature or education, have a more than ordinary facility of association. But there are other accidental combinations, which are apt to lay hold of the most vigorous understandings; and from which, as they are the natural and necessary result of a limited experience, no superiority of intellect is sufficient to preserve a philosopher, in the infancy of physical science.

As the connections among physical events are discovered to us by experience alone, it is evident that, when we see a phenomenon preceded by a number of different circumstances, it is impossible for us to determine, by any reasoning *à priori*, which of these circumstances are to be regarded as the *constant*, and which as the *accidental*, antecedents of the effect. If, in the course of our experience, the same combination of circumstances is always exhibited to us without any alteration, and is invariably followed by the same result, we must for ever remain ignorant, whether this result be connected with the whole combination, or with one or more of the circumstances combined; and therefore, if we are anxious, upon any occasion, to produce a similar effect, the only rule that we can follow with perfect security, is to imitate in every particular circumstance the combination which we have seen. It is only where we have an opportunity of separating such circumstances from each other;

of combining them variously together; and of observing the effects which result from these different experiments, that we can ascertain with precision the general laws of nature, and strip physical causes of their accidental and unessential concomitants.

To illustrate this by an example. Let us suppose that a savage, who, in a particular instance, had found himself relieved of some bodily indisposition by a draught of cold water, is a second time afflicted with a similar disorder, and is desirous to repeat the same remedy. With a limited degree of experience which we have here supposed him to possess, it would be impossible for the acutest philosopher, in his situation, to determine, whether the cure was owing to the water which was drunk, to the cup in which it was contained, to the fountain from which it was taken, to the particular day of the month, or to the particular age of the moon. In order, therefore, to insure the success of the remedy, he will very naturally, and very wisely, copy, as far as he can recollect, every circumstance which accompanied the first application of it. He will make use of the same cup, draw the water from the same fountain, hold his body in the same posture, and turn his face in the same direction; and thus all the accidental circumstances in which the first experiment was made, will come to be associated equally in his mind with the effect produced. The fountain from which the water was drawn, will be considered as possessed of particular virtues; and the cup from which it was drunk, will be set apart from vulgar uses, for the sake of those who may afterwards have occasion to apply the remedy. It is the enlargement of experience alone, and not any progress in the art of reasoning, which can cure the mind of these associations, and free the practice of medicine from those superstitious observances with which we always find it incumbered among rude nations.

Many instances of this species of superstition might be produced from the works of philosophers who have flourished in more enlightened ages. In particular, many might be produced from the writings of those physical inquirers who immediately succeeded to Lord Bacon; and who, convinced by his arguments of the folly of all reasonings *à priori* concerning the laws of nature, were frequently apt to run into the opposite extreme, by recording every circumstance, even the most ludicrous, and the most obviously unessential, which attended their experiments.*

Moral and political prejudices traced to the association of ideas. — The observations which have been hitherto made, relate entirely to associations founded on casual combinations of *material* objects, or of *physical* events. The effects which these associations produce on the understanding, and which are so palpable that they cannot fail to strike the most careless observer, will prepare the reader for the remarks I am now to make, on some analogous prejudices which warp our opinions on still more important subjects.

As the established laws of the material world, which have been exhibited to our senses from our infancy, gradually accommodate to themselves the order of our thoughts; so the most arbitrary and capricious *institutions and customs*, by a long and constant and exclusive operation on the mind, acquire such an influence in forming the intellectual habits, that every deviation from them not only produces surprise, but is apt to excite sentiments of contempt and of ridicule.† A person who has never extended his views beyond that society of which he himself is a member, is apt to consider many peculiarities in the manners and customs of his countrymen as founded on the universal principles of the human constitution; and when he hears of other nations, whose practices in similar cases are different, he is apt to censure them as unnatural, and to despise them as absurd. There are two classes of men who have more particularly been charged with this weakness; those who are placed at the bottom, and those who have reached the summit, of the scale of refinement; the former from ignorance, and the latter from national vanity.

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* The reader will scarcely believe, that the following cure for a dysentery is copied *verbatim* from the works of Mr. Boyle: —

"Take the thigh-bone of a hanged man, (perhaps another may serve, but this was still made use of,) calcine it to whiteness, and having purged the patient with an antimonial medicine, give him one drachm of this white powder for one dose, in some good cordial, whether conserve or liquor."

† "Nous nous accoutumons à tout ce que nous voyons; et je ne scais si le consulat du cheval de Caligula nous auroit autant surpris que nous nous l'imaginons." [We become accustomed to every thing which we see; and I do not know that the consulship of Caligula's horse would have surprised us as much as we imagine.] — *Cardinal de Retz.*

For curing this class of prejudices, the obvious expedient which nature points out to us, is to extend our acquaintance with human affairs, either by means of books, or of personal observation. The effects of travelling, in enlarging and in enlightening the mind, are obvious to our daily experience; and similar advantages may be derived, (although, perhaps, not in an equal degree,) from a careful study of the manners of past ages or of distant nations, as they are described by the historian. In making, however, these attempts for our intellectual improvement, it is of the utmost consequence to us to vary, to a considerable degree, the objects of our attention, in order to prevent any danger of our acquiring an exclusive preference for the caprices of any one people, whose political situation, or whose moral character, may attach us to them as faultless models for our imitation. The same weakness and versatility of mind, the same facility of association, which, in the case of a person who has never extended his views beyond his own community, is a source of national prejudice and of national bigotry, renders the mind, when formed into new situations, easily susceptible of other prejudices no less capricious; and frequently prevents the time, which is devoted to travelling, or to study, from being subservient to any better purpose, than an importation of foreign fashions, or a still more ludicrous imitation of ancient follies.

The philosopher whose thoughts dwell habitually, not merely upon what is, or what has been, but upon what is best and most expedient for mankind; who, to the study of books, and the observation of manners, has added a careful examination of the principles of the human constitution, and of those which ought to regulate the social order; is the only person who is effectually secured against both the weaknesses which I have described. By learning to separate what is essential to morality and to happiness, from those adventitious trifles which it is the province of fashion to direct, he is equally guarded against the follies of national prejudices, and a weak deviation, in matters of indifference, from established ideas. Upon his mind, thus occupied with important subjects of reflection, the fluctuating caprices and fashions of the times lose their influence; while accustomed to avoid the slavery of local and arbitrary habits, he possesses, in his own genuine simplicity of character, the same power of accommodation to external circumstances, which men of the world derive from the pliability of their taste and the versatility of their manners. As the order too, of his ideas is accommodated, not to what is casually presented from without, but to his own systematical principles, his associations are subject only to those slow and pleasing changes which arise from his growing light and improving reason; and, in such a period of the world as at present, when the press not only excludes the possibility of a permanent retrogradation in human affairs, but operates with an irresistible though gradual progress, in undermining prejudices and in extending the triumphs of philosophy, he may reasonably indulge the hope, that society will every day approach nearer and nearer to what he wishes it to be. A man of such a character, instead of looking back on the past with regret, finds himself (if I may use the expression) more at home in the world, and more satisfied with its order, the longer he lives in it. The melancholy contrast which old men are sometimes disposed to state, between its condition when they are about to leave it, and that in which they found it at the commencement of their career, arises, in most cases, from the unlimited influence which, in their early years, they had allowed to the fashions of the times, in the formation of their characters. How different from those sentiments and prospects which dignified the retreat of Turgot, and brightened the declining years of Franklin!

How unconscious changes of opinion are produced. — The querulous temper, however, which is incident to old men, although it renders their manners disagreeable in the intercourse of social life, is by no means the most contemptible form in which the prejudices I have now been describing may display their influence. Such a temper indicates at least a certain degree of observation, in marking the vicissitudes of human affairs, and a certain degree of sensibility in early life, which has connected pleasing ideas with the scenes of infancy and youth. A very great proportion of mankind are, in a great measure, incapable either of the one or of the other; and suffering themselves to be carried quietly along with the stream of fashion, and finding their opinions and their feelings always in the same relative situation to the fleeting objects around them, are perfectly unconscious of any progress in their own ideas, or of any change in the manners of their age. In vain the philosopher reminds them of the opinions they yesterday held; and forewarns them, from the spirit of the times, of those which they are to hold to-morrow. The opinions of the present moment seem to them to be inseparable from their constitution; and when the prospects are realized, which they lately treated as chimerical, their minds are so gradually prepared for the event, that they behold it without any emotions of wonder or curiosity; and it is to the philosopher alone, by whom it was predicted, that it appears to furnish a subject worthy of future reflection.*

The prejudices to which the last observations relate, have their origin in that disposition of our nature, which accommodates the order of our ideas, and our various intellectual habits, to whatever appearances have been long and familiarly presented to the mind. But there are other prejudices, which, by being intimately associated with the essential principles of our constitution, or with the original and universal laws of our belief, are incomparably more inveterate in their nature, and have a far more extensive influence on human character and happiness.

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* Some reflections similar to the above are subjoined by Gibbon to his account of the fable of the Seven Sleepers of Ephesus. "The story of the seven sleepers has been adopted and adorned by the nations from Bengal to Africa, who profess the Mahometan religion; and some vestiges of a similar tradition have been discovered in the remote extremities of Scandinavia. This easy and universal belief, so expressive of the sense of mankind, may be ascribed to the genuine merit of the fable itself. We imperceptibly advance from youth to age, without observing the gradual, but incessant change of human affairs; and even in our larger experience of history, the imagination is accustomed, by a perpetual series of causes and affects, to unite the most distant revolutions. But if the interval between two memorable eras could be instantly annihilated; if it were possible, after a momentary slumber of two hundred years, to dis-

3. *The support which error derives from its accidental association with truth.* — The manner in which the association of ideas operates in producing this third class of our speculative errors, may be conceived, in part, from what was formerly said, concerning the superstitious observances, which are mixed with the practice of medicine among rude nations. As all the different circumstances which accompanied the first administration of a remedy, come to be considered as essential to its future success, and are blended together in our conceptions, without any discrimination of their relative importance; so, whatever tenets and ceremonies we have been taught to connect with the religious creed of our infancy, become almost a part of our constitution, by being indissolubly united with truths which are essential to happiness, and which we are led to reverence and to love by all the best dispositions of the heart. The astonishment which the peasant feels, when he sees the rites of a religion different from his own, is not less great than if he saw some flagrant breach of the moral duties, or some direct act of impiety to God; nor is it easy for him to conceive, that there can be any thing worthy in a mind which treats with indifference

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play the *new* world to the eyes of a spectator, who still retained a lively and recent impression of the *old*, his surprise and his reflections would furnish the pleasing subject of a philosophical romance." — *Decline and Fall.* vol. 6, pp. 35, 36.

To these observations may be added a remark of Lord Bacon's, to the truth of which our daily experience bears testimony. "Levitas hominum atque inconstantia hinc optime perspici potest, qui donec res aliqua perfecta sit, eam mirantur fieri posse; postquam facta semel est, iterum mirantur eam jampridem factam non fuisse." [The levity and inconsistency of men can best be seen in this; — that before a certain thing is accomplished, they doubt its possibility; but when it is once done, they wonder why it was not done long ago.] — Bac. *De. Aug. Scient.* Lib. i.

what awakens in his own breast all its best and sublimest emotions. "Is it possible," says the old and expiring Bramin, in one of Marmontel's tales, to the young English officer who had saved the life of his daughter, "is it possible, that he to whose compassion I owe the preservation of my child, and who now soothes my last moments with the consolations of piety, should not believe in the god *Vistnou,* and his nine metamorphoses!"

What has now been said on the nature of religious superstition, may be applied to many other subjects. In particular, it may be applied to those political prejudices which bias the judgment even of enlightened men in all countries of the world.

How deeply rooted in the human frame are those important principles, which interest the good man in the prosperity of the world; and more especially in the prosperity of that beloved community to which he belongs! How small, at the same time, is the number of individuals, who, accustomed to contemplate one modification alone of the social order, are able to distinguish the circumstances which are essential to human happiness, from those which are indifferent or hurtful! In such a situation, how natural is it for a man of benevolence, to acquire an indiscriminate and superstitious veneration for all the institutions under which he has been educated; as these institutions, however capricious and absurd in themselves, are not only familiarized by habit to all his thoughts and feelings, but are consecrated in his mind by an indissoluble association with duties which nature recommends to his affections, and which reason commands him to fulfil. It is on these accounts, that a superstitious zeal against innovation, both in religion and politics, where it is evidently grafted on piety to God and good-will to mankind, however it may excite the sorrow of the more enlightened philosopher, is justly entitled, not only to his indulgence, but to his esteem and affection.

The remarks which have been already made, are sufficient to show how necessary it is for us, in the formation of our philosophical principles, to examine with care all those opinions which, in our early years, we have imbibed from our instructors; or which are connected with our own local situation. *Nor does* *the universality of an opinion among men who have received a similar education, afford any presumption in its favor;* for however great the deference is, which a wise man will always pay to common belief, upon those subjects which have employed the unbiased reason of mankind, he certainly owes it no respect, in so far as he suspects it to be influenced by fashion or authority. Nothing can be more just than the observation of Fontenelle, that "the number of those who believe in a system already established in the world, does not, in the least, add to its credibility; but that the number of those who doubt of it has a tendency to diminish it."

The same remarks lead, upon the other hand, to another conclusion of still greater importance; that, notwithstanding the various false opinions which are current in the world, *there are some truths which are inseparable from the human understanding*, and by means of which, the errors of education, in most instances, are enabled to take hold of our belief.

A weak mind, unaccustomed to reflection, and which has passively derived its most important opinions from habits or from authority, when, in consequence of a more enlarged intercourse with the world, it finds that ideas which it had been taught to regard as sacred, are treated by enlightened and worthy men with ridicule, is apt to lose its reverence for the fundamental and eternal truths on which these accessory ideas are grafted, and easily falls a prey to that skeptical philosophy which teaches, that all the opinions, and all the principles of action by which mankind are governed, may be traced to the influence of education and example. Amidst the infinite variety of forms, however, which our versatile nature assumes, it cannot fail to strike an attentive observer, that there are certain indelible features common to them all. In one situation, we find good men attached to a republican form of government; in another, to a monarchy; but in all situations, we find them devoted to the service of their country and of mankind, and disposed to regard, with reverence and love, the most absurd and capricious institutions which custom has led them to connect with the order of society. The different appearances, therefore, which the political opinions and the political conduct of men exhibit, while they demonstrate to what a wonderful degree human nature may be influenced by situation and by early instruction, evince the existence of some common and original principles, which fit it for the political union, and illustrate the uniform operation of those laws of association, to which, in all the stages of society, it is equally subject.

These principles applicable to questions of religion and morality. — Similar observations are applicable, and, indeed, in a still more striking degree, to the opinions of mankind on the important questions of religion and morality. The variety of systems which they have formed to themselves concerning these subjects, has often excited the ridicule of the skeptic and the libertine; but if, on the one hand, this variety shows the folly of bigotry, and the reasonableness of mutual indulgence; the curiosity which has led men in every situation to such speculations, and the influence which their conclusions, however absurd, have had on their character and their happiness, prove, no less clearly on the other, that there must be some principles from which they all derive their origin; and invite the philosopher to ascertain what are these original and immutable laws of the human mind.

"Examine," says Mr. Hume, "the religious principles which have prevailed in the world. You will scarcely be persuaded, that there are any thing but sick men's dreams; or, perhaps, will regard them more as the playsome whimseys of monkeys in human shape, than the serious, positive, dogmatical asseverations of a being who dignifies himself with the name of rational." — "To oppose the torrent of scholastic religion by such feeble maxims as these, that it is impossible for the same thing to be and not to be; that the whole is greater than a part; that two and three make five: is pretending to stop the ocean with a bulrush." But what is the inference to which we are led by these observations? Is it, to use the words of this ingenious writer, "that the whole is a riddle, an enigma, an inexplicable mystery; and that doubt, uncertainty, and suspense, appear the only result of our most accurate scrutiny concerning this subject?" Or should not rather the melancholy histories which he has exhibited of the follies and caprices of superstition, direct our attention to those sacred and indelible characters on the human mind, which all these perversions of reason are unable to obliterate; like that image of himself, which Phidias wished to perpetuate, by stamping it so deeply on the buckler of his *Minerva*; "ut nemo delere posset aut divellere, qui totam statuam non imminueret;" [that no one could destroy it or take it away, without ruining the whole statue.] In truth, the more strange the contradictions, and the more ludicrous the ceremonies, to which the pride of human reason has thus been reconciled; the stronger is our evidence that religion has a foundation in the nature of man. When the greatest of modern philosophers declares, that "he would rather believe all the fables in the Legend, and the Talmud, and the Alcoran, than that this universal frame is without mind;" (Lord Bacon, in his Essays;) he has expressed the same feeling, which, in all ages and nations, has led good men, unaccustomed to reasoning, to an implicit faith in the creed of their infancy; — a feeling which affords an evidence of the existence of the Deity incomparably more striking, than if, unmixed with error and undebased by superstition, this most important of all principles had commanded the universal assent of mankind. Where are the other truths, in the whole circle of the sciences, which are so essential to human happiness, as to procure an easy access, not only for themselves, but for whatever opinions may happen to be blended with them? Where are the truths so venerable and commanding, as to impart their own sublimity to every trifling memorial which recalls them to our remembrance; to bestow solemnity and elevation on every mode of expression by which they are conveyed; and which, in whatever scene they have habitually occupied the thoughts, consecrate every object which it presents to our senses, and the very ground we have been accustomed to tread? To attempt to weaken the authority of such impressions, by a detail of the endless variety of forms which they derive from casual associations, is surely an employment unsuitable to the dignity of philosophy. To the vulgar it may be amusing, in this, as in other instances, to indulge their wonder at what is new or uncommon; but to the philosopher it belongs to perceive, under all these various disguises, the workings of the same common nature; and in the superstitions of Egypt, no less than in the lofty visions of Plato, to recognize the existence of those moral ties which unite the heart of man to the Author of his being.

II. *Influence of the association of ideas on our judgments in matters of taste. How taste is formed.* — The very general observations which I am to make in this Section, do not presuppose any particular theory concerning the nature of taste. It is sufficient for my purpose to remark, that *taste is not a simple and original faculty, but a power gradually formed by experience and observation.* It implies, indeed, as its groundwork, a certain degree of natural sensibility; but it implies also the exercise of the judgment; and is the slow result of an attentive examination and comparison of the agreeable or disagreeable effects produced on the mind by external objects.

The view which was formerly given of the process by which the general laws of the material world are investigated, and which I endeavored to illustrate by the state of medicine among rude nations, is strictly applicable to the history of taste. That certain objects are fitted to give pleasure, and others disgust, to the mind, we know from experience alone; and it is impossible for us, by any reasoning *à priori,* to explain *how* the pleasure or the pain is produced. In the works of nature we find, in many instances, beauty and sublimity involved among circumstances which are either indifferent, or which obstruct the general effect; and it is only by a train of experiments, that we can separate those circumstances from the rest, and ascertain with what particular qualities the pleasing effect is connected. Accordingly, the inexperienced artist, when he copies nature, will copy her servilely, that he may be certain of securing the pleasing effect; and the beauties of his performances will be incumbered with a number of superfluous or of disagreeable concomitants. Experience and observation alone can enable him to make this discrimination; to exhibit the principles of beauty pure and unadulterated, and to form a creation of his own, more faultless than ever fell under the observation of his senses.

This analogy between the progress of taste from rudeness to refinement, and the progress of physical knowledge from the superstitions of a savage tribe to the investigation of the laws of nature, proceeds on the supposition, that, as in the material world there are general facts, beyond which philosophy is unable to proceed; so, in the constitution of man, there is an inexplicable adaptation of the mind to the objects with which these faculties are conversant; in consequence of which, these objects are fitted to produce agreeable or disagreeable emotions. In both cases, reasoning may be employed with propriety to refer particular phenomena to general principles; but in both cases, we must at last arrive at principles of which no account can be given, but that such is the will of our Maker.

The influence of casual associations on taste. — A great part, too, of the remarks which were made in the last section on the origin of popular prejudices, may be applied to explain the influence of casual associations on taste; but these remarks do not so completely exhaust the subject, as to supersede the necessity of further illustration. In matters of taste, the effects which we consider are produced on the mind itself; and are accompanied either with pleasure or with pain. Hence the tendency to casual association is much stronger than it commonly is, with respect to physical events; and when such associations are once formed, as they do not lead to any important inconvenience, similar to those which result from physical mistakes, they are not so likely to be corrected by mere experience, unassisted by study. To this it is owing, that the influence of association on our judgments concerning beauty and deformity, is still more remarkable than on our speculative conclusions; a circumstance which has led some philosophers to suppose, that association is sufficient to account for the origin of these notions, and that there is no such thing as a standard of taste, founded on the principles of the human constitution. But this is undoubtedly pushing the theory a great deal too far. The association of ideas can never account for the origin of a *new* notion, or of a pleasure *essentially different* from all the others which we know. It may, indeed, enable us to conceive how a thing, indifferent in itself, may become a source of pleasure, by being connected in the mind with something else which is naturally agreeable; but it presupposes, in every instance, the existence of those notions and those feelings which it is its province to combine: insomuch that, I apprehend, it will be found, wherever association produces a change in our judgments on matters of taste, it does so by coöperating with some natural principle of the mind, and implies the existence of certain original sources of pleasure and uneasiness.

How fashions change. — A mode of dress, which at first appeared awkward, acquires, in a few weeks or months, the appearance of elegance. By being accustomed to see it worn by those whom we consider as models of taste, it becomes associated with the agreeable impressions which we receive from the ease and grace and refinement of their manners. When it pleases by itself, the effect is to be ascribed, not to the object actually before us, but to the impressions with which it has been generally connected, and which it naturally recalls to the mind.

This observation points out the cause of the perpetual vicissitudes in dress, and in every thing whose chief recommendation arises from fashion. It is evident that, as far as the agreeable effect of an ornament arises from association, the effect will continue only while it is confined to the higher orders. When it is adopted by the multitude, it not only ceases to be associated with ideas of taste and refinement, but it is associated with ideas of affectation, absurd imitation, and vulgarity. It is accordingly laid aside by the higher orders, who studiously avoid every circumstance in external appearance which is debased by low and common use; and they are led to exercise their invention in the introduction of some new peculiarities, which first become fashionable, then common, and last of all, are abandoned as vulgar.

It has often been remarked, that after a certain period in the progress of society, the public taste becomes corrupted; and the different productions of the fine arts begin to degenerate from that simplicity, which they had attained in their state of greatest perfection. One reason of this decline is suggested by the foregoing observations.

From the account which has been given of the natural progress of taste, in separating the genuine principles of beauty from superfluous and from offensive concomitants, it is evident, that there is a limit, beyond which the love of simplicity cannot be carried. No bounds, indeed, can be set to the creations of genius; but as this quality occurs seldom in an eminent degree, it commonly happens, that after a period of great refinement of taste, men begin to gratify their love of variety, by adding superfluous circumstances to the finished models exhibited by their predecessors, or by making other trifling alterations on them, with a view merely of diversifying the effect. These additions and alterations, indifferent perhaps, or even in some degree offensive in themselves, acquire soon a borrowed beauty, from the connection in which we see them, or from the influence of fashion: the same cause which at first produced them, continues perpetually to increase their number; and taste returns to barbarism, by almost the same steps which conducted it to perfection.

The truth of these remarks will appear still more striking to those who consider the wonderful effect which a writer of splendid genius, but of incorrect taste, has in misleading the public judgment. The peculiarities of such an author are consecrated by the connection in which we see them, and even please, to a certain degree, when detached from the excellences of his composition, by recalling to us the agreeable impressions with which they have been formerly associated. How many imitations have we seen of the affectations of Sterne, by men who were unable to copy his beauties! And yet these imitations of his defects; of his abrupt manner; of his minute specification of circumstances; and even of his dashes, produce, at first, some effect on readers of sensibility, but of uncultivated taste, in consequence of the exquisite strokes of the pathetic, and the singular vein of humor, with which they are united in the original.

Two kinds of taste distinguished.—From what has been said, it is obvious, that the circumstances which please in the objects of taste, are of two kinds: *first*, those which are fitted to please by nature, or by associations which all mankind are led to form by their common condition; and, *secondly*, those which please in consequence of associations arising from local and accidental circumstances. Hence, there are two kinds of taste; the one enabling us to judge of those beauties which have a foundation in the human constitution; the other, of such objects as derive their principal recommendation from the influence of fashion.

These two kinds of taste are not always united in the same person; indeed, I am inclined to think, that they are united but rarely. The perfection of the one depends much upon the degree in which we are able to free the mind from the influence of casual associations; that of the other, on the contrary, depends on a facility of association, which enables us to fall in, at once, with all the turns of the fashion, and, as Shakspeare expresses it, "to catch the tune of the times."

The influence of association on language.—I shall endeavor to illustrate some of the foregoing remarks, by applying them to the subject of language, which affords numberless instances to exemplify the influence which the association of ideas has on our judgments in matters of taste.

In the same manner in which an article of dress acquired an appearance of elegance or of vulgarity from the persons by whom it is habitually worn; so a particular mode of pronunciation acquires an air of fashion or of rusticity, from the persons by whom it is habitually employed. The Scotch accent is surely in itself as good as the English, and with a few exceptions, is as agreeable to the ear; and yet how offensive does it appear, even to us, who have been accustomed to hear it from our infancy, when compared with that which is used by our southern neighbors!—No reason can be given for this, but that the capital of Scotland is now become a provincial town, and London is the seat of our court.

The distinction which is to be found in the languages of all civilized nations, between low and polite modes of expression, arises from similar causes. It is, indeed, amusing to remark the solicitude with which the higher orders, in the monarchies of modern Europe, avoid every circumstance in their exterior appearance and manner, which, by the most remote association, may, in the minds of others, connect them with the idea of the multitude. Their whole dress and deportment and conversation are studiously arranged to convey an imposing notion of their consequence; and to recall to the spectator, by numberless slight and apparently unintentional hints, the agreeable impressions which are associated with the advantages of fortune.

To this influence of association on language, it is necessary for every writer to attend carefully, who wishes to express himself with elegance. For the attainment of correctness and purity in the use of words, the rules of grammarians and of critics may be a sufficient guide; but it is not in the works of this class of authors, that the higher beauties of style are to be studied. As the air and manner of a gentleman can be acquired only by living habitually in the best society, so grace in composition must be attained by an habitual acquaintance with classical writers. It is indeed necessary for our information, that we should peruse occasionally many books which have no merit in point of expression; but I believe it to be extremely useful to all literary men, to counteract the effect of this miscellaneous reading, by maintaining a constant and familiar acquaintance with a few of the most faultless models which the language affords. For want of some standard of this sort, we frequently see an author's taste in writing alter much to the worse in the course of his life; and his later productions fall below the level of his early essays. D'Alembert tells us, that Voltaire had always lying on his table the Petit Carême of Massillon, and the tragedies of Racine; the former to fix his taste in prose composition, and the latter in poetry.

In avoiding, however, expressions which are debased by vulgar use, there is a danger of running into the other extreme in quest of fashionable words and phrases. Such an affectation may, for a few years, gratify the vanity of an author, by giving him the air of a man of the world; but the reputation it bestows is of a very transitory nature. The works which continue to please from age to age are written with perfect simplicity, while those which captivate the multitude by a display of meretricious ornaments, if, by chance, they should survive the fashions to which they are accommodated, remain only to furnish a subject of ridicule to posterity. The portrait of a beautiful woman in the fashionable dress of the day may please at the moment it is painted, nay, may perhaps please more than in any that the fancy of the artist could have suggested; but it is only in the plainest and simplest drapery that the most perfect form can be transmitted with advantage to future times.

The exceptions which the history of literature seems to furnish to these observations are only apparent. That, in the works of our best authors there are many beauties which have long and generally been admired, and which yet owe their whole effect to association, cannot be disputed; but, in such cases, it will always be found that the associations which are the foundation of our pleasures, have, in consequence of some peculiar combination of circumstances, been more widely diffused, and more permanently established among mankind, than those which date their origin from the caprices of our own age are ever likely to be. An admiration for the classical remains of antiquity is, at present, not less general in Europe than the advantages of a liberal education; and such is the effect of this admiration, that there are certain caprices of taste from which no man who is well educated is entirely free. A composition in a modern language, which should sometimes depart from the ordinary modes of expression, from an affectation of the idioms which are consecrated in the classics, would please a very wide circle of readers, in consequence of the prevalence of classical associations; and therefore, such affectations, however absurd when carried to a degree of singularity, are of a far superior class to those which are adapted to the fashions of the day. But still the general principle holds true, that whatever beauties derive their original merely from casual association, must appear capricious to those to whom the association does not extend; and that the simplest style is that which continues longest to please, and which pleases most universally. In the writings of Mr. Harris, there is a certain classical air which will always have many admirers, while ancient learning continues to be cultivated, but which, to a mere English reader, appears somewhat unnatural and ungraceful, when compared with the composition of Swift or of Addison.

Influence of classical associations on the arts. — The analogy of the arts of statuary and painting may be of use in illustrating these remarks. The influence of ancient times has extended to these, as well as to the art of writing; and, in this case, no less than in the other, the transcendent power of genius has established a propriety of choice in matters of indifference, and has, perhaps, consecrated in the opinion of mankind some of its own caprices.

"Many of the ornaments of art," says Sir Joshua Reynolds, "those at least for which no reason can be given, are transmitted to us, are adopted, and acquire their consequence from the company in which we have been used to see them. As Greece and Rome are the fountains from whence have flowed all kinds of excellence, to that veneration which they have a right to claim for the pleasure and knowledge which they have afforded us, we voluntarily add our approbation of every ornament and every custom that belonged to them, even to the fashion of their dress. For it may be observed, that, not satisfied with them in their own place, we make no difficulty of dressing statues of modern heroes or senators in the fashion of the Roman armor, or peaceful robe, and even go so far as hardly to bear a statue in any other drapery.

"The figures of the great men of those nations have come down to us in sculpture. In sculpture remain almost all the excellent specimens of ancient art. We have so far associated personal dignity to the persons thus represented, and the truth of art to their manner of representation, that it is not in our power any longer to separate them. This is not so in painting, because, having no excellent ancient portraits, that connection was never formed. Indeed, we could no more venture to paint a general officer in a Roman military habit, than we could make a statue in the present uniform. But since we have no ancient portraits to show how ready we are to adopt those kind of prejudices, we make the best authority among the moderns serve the same purpose. The great variety of excellent portraits with which Vandyke has enriched this nation, we are not content to admire for their real excellence, but extend our approbation even to the dress which happened to be the fashion of that age. By this means, it must be acknowledged, very ordinary pictures acquired something of the air and effect of the works of Vandyke, and appeared therefore, at first sight, better pictures than they really were. They appeared so, however, to those only who had the means of making this association."

The language of poetry affected by casual associations. — The influence of association on our notions concerning language, is still more strongly exemplified in poetry than in prose. As it is one great object of the poet, in his serious productions, to elevate the imagination of his readers above the grossness of sensible objects, and the vulgarity of common life, it becomes peculiarly necessary for him to reject the use of all words and phrases which are trivial and hackneyed. Among those which are equally pure and equally perspicuous, he, in general, finds it expedient to adopt that which is the least common. Milton prefers the words Rhene and Danaw to the more common words Rhine and Danube: —

> "A multitude, like which the populous North
> Pour'd never from his frozen loins, to pass
> Rhene or the Danaw."

In the following line,

> "Things unattempted yet in prose or rhyme,"

how much more suitable to the poetical style does the expression appear, than if the author had said,

> "Things unattempted yet in prose or verse."

In another passage, where, for the sake of variety, he has made use of the last phrase, he adds an epithet, to remove it a little from the familiarity of ordinary discourse.

> ——— "in prose or numerous verse."

Peculiarities of poetical diction. — In consequence of this circumstance, there arises gradually in every language *a poetical diction*, which differs widely from the common diction of prose. It is much less subject to the vicissitudes of fashion, than the polite modes of expression in familiar conversation; because, when it has once been adopted by the poet, it is avoided by good prose writers, as being too elevated for that species of composition. It may therefore retain its charm, as long as the language exists; nay, the charm may increase, as the language grows older.

Indeed, the charm of poetical diction must increase to a certain degree, as polite literature advances. For when once a set of words has been consecrated to poetry, the very sound of them, independently of the ideas they convey, awakens, every time we hear it, the agreeable impressions which were connected with it when we met with them in the performances of our favorite authors. Even when strung together in sentences which convey no meaning, they produce some effect on the mind of a reader of sensibility; an effect, at least, extremely different from that of an unmeaning sentence in prose.

Languages differ from each other widely in the copiousness of their poetical diction. Our own possesses, in this respect, important advantages over the French; not that in this language there are no words appropriated to poetry, but because their number is, comparatively speaking, extremely limited.

The scantiness of the French poetical diction is, probably, attended with the less inconvenience, that the phrases which occur in good prose writing are less degraded by vulgar application than in English, in consequence of the line being more distinctly and more strongly drawn between polite and low expressions in that language than in ours. Our poets, indeed, by having a language appropriated to their own purposes, not only can preserve dignity of expression, but can connect with the perusal of their compositions, the pleasing impressions which have been produced by those of their predecessors. And hence, in the higher sorts of poetry, where their object is to kindle, as much as possible, the enthusiasm of their readers, they not only avoid, studiously, all expressions which are vulgar, but all such as are borrowed from fashionable life. This certainly cannot be done in an equal degree by a poet who writes in the French language.

In English, the poetical diction is so extremely copious, that it is liable to be abused; as it puts it in the power of authors of no genius, merely by ringing changes on the poetical vocabulary, to give a certain degree of currency to the most unmeaning compositions. In Pope's *Song by a Person of Quality*, the incoherence of ideas is scarcely greater than what is to be found in some admired passages of our fashionable poetry.

Nor is it merely by a difference of words, that the language of poetry is distinguished from that of prose. When a poetical *arrangement* of words has once been established by authors of reputation, the most common expressions, by being presented in this consecrated order, may serve to excite poetical associations.

On the other hand, nothing more completely destroys the charm of poetry, than a string of words which the custom of ordinary discourse has arranged in so invariable an order, that the whole phrase may be anticipated from hearing its commencement. A single word frequently strikes us as flat and prosaic, in consequence of its familiarity; but two such words, coupled together in the order of conversation, can scarcely be introduced into serious poetry without appearing ludicrous.

No poet in our language has shown so strikingly as Milton, the wonderful elevation which style may derive from an arrangement of words, which, while it is perfectly intelligible, departs widely from that to which we are in general accustomed. Many of his most sublime periods, when the order of the words is altered, are reduced nearly to the level of prose.

To copy this artifice with success is a much more difficult attainment than is commonly imagined: and, of consequence, when it is acquired, it secures an author, to a great degree, from that crowd of imitators who spoil the effect of whatever is not beyond their reach. To the poet who uses blank verse, it is an acquisition of still more essential consequence than to him who expresses himself in rhyme; for the more that the structure of the verse approaches to prose, the more it is necessary to give novelty and dignity to the composition. And accordingly, among our magazine poets, ten thousand catch the structure of Pope's versification, for one who approaches to the manner of Milton or of Thomson.

The facility, however, of this imitation, like every other, increases with the number of those who have studied it with success; for the more numerous the authors who have employed their genius in any one direction, the more copious are the materials out of which mediocrity may select and combine, so as to escape the charge of plagiarism. And, in fact, in our own language, this, as well as the other great resource of poetical expression, the employment of appropriated words, has had its effects so much impaired by the abuse which has been made of it, that a few of our best poets of late have endeavored to strike out a new path for themselves, by resting the elevation for their composition chiefly on a singular, and, to an ordinary writer, an unattainable, union of harmonious versification with a natural arrangement of words and a simple elegance of expression. It is this union which seems to form the distinguishing charm of the poetry of Goldsmith.

From the remarks which have been made on the influence of the association of ideas on our judgments in matters of taste, it is obvious how much the opinions of a nation with respect to merit in the fine arts, are likely to be influenced by the form of their government, and the state of their manners. Voltaire, in his discourse pronounced at his reception into the French academy, gives several reasons why the poets of that country have not succeeded in describing rural scenes and employments. The principal one is, the ideas of meanness, and poverty, and wretchedness, which the French are accustomed to associate with the profession of husbandry. The same thing is alluded to by the Abbé de Lille, in the preliminary discourse prefixed to his translation of the Georgics. "A translation," says he, "of this poem, if it had been undertaken by an author of genius, would have been better calculated than any other work, for adding to the riches of our language. A version of the Æneid itself, however well executed, would, in this respect be of less utility, inasmuch as the genius of our tongue accommodates itself more easily to the description of heroic achievements, than to the details of natural phenomena, and of the operations of husbandry. To force it to express these with suitable dignity, would have been a real conquest over that false delicacy, which it has contracted from our unfortunate prejudices."

How different must have been the emotions with which this divine performance of Virgil was read by an ancient Roman, while he recollected that period in the history of his country, when dictators were called from the plough to the defence of the state, and after having led monarchs in triumph, returned again to the same happy and independent occupation. A state of manners to which a Roman author of a later age looked back with such enthusiasm, that he ascribes, by a bold, poetical figure, the flourishing state of agriculture under the republic, to the grateful returns which the earth then made to the illustrious hands by which she was cultivated. "Gaudente terra vomere laureato, et triumphali aratore." [The land rejoicing because the plough is wreathed with laurel, and the husbandman has received the honors of a triumph.] (Plin. *Nat. Hist.* xviii. 4.)

III. *Of the influence of association on our active principles, and on our moral judgments.* — In order to illustrate a little further the influence of the association of ideas on the human mind, I shall add a few remarks on some of its effects on our active and moral principles. In stating these remarks, I shall endeavor to avoid, as much as possible, every occasion of controversy, by confining myself to such general views of the subject, as do not presuppose any particular enumeration of our original principles of action, or any particular system concerning the nature of the moral faculty. If my health and leisure enable me to carry my plans into execution, I propose, in the sequel of this work, to resume these inquiries, and to examine the various opinions to which they have given rise.

The manner in which the association of ideas operates in producing new principles of action, has been explained very distinctly by different writers. Whatever conduces to the gratification of any natural appetite, or any natural desire, is itself desired on account of the end to which it is subservient; and by being thus habitually associated in our apprehension with agreeable objects, it frequently comes, in process of time, to be regarded as valuable in itself, independently of its utility. It is thus that *wealth* becomes, with many *an ultimate object of pursuit;* although, at first, it is undoubtedly valued merely on account of its *subserviency to the attainment of other objects.* In like manner, men are led to desire dress, equipage, retinue, furniture, on account of the estimation in which they are supposed to be held by the public. Such desires are called by Dr. Hutcheson, (see his Essay on the Nature and Conduct of the Passions,) *secondary* desires; and their origin is explained by him in the way in which I have mentioned. "Since we are capable," says he, "of reflection, memory, observation, and reasoning about the distant tendencies of objects and actions, and not confined to things present, there must arise, in consequence of our *original* desires, *secondary* desires of every thing imagined *useful to gratify any of the primary desires;* and that with strength proportioned to the several original desires, and imagined usefulness or necessity of the advantageous object." "Thus," he continues, "as soon as we come to apprehend the use of wealth or power to gratify any of our original desires, we must also desire them; and hence arises the universality of these desires of wealth and power, since they are the means of gratifying all other desires." The only thing that appears to me exceptionable in the foregoing passage is, that the author classes the desire of *power* with that of *wealth;* whereas I apprehend it to be clear, (for reasons which I shall state in another part of this work,) that the former is a primary desire, and the latter a secondary one.

How our moral judgments are perverted.— Our moral judgments, too, may be modified, and even perverted, to a certain degree, in consequence of the operation of the same principle. In the same manner in which a person who is regarded as a model of taste may introduce, by his example, an absurd or fantastical dress; so a man of splendid virtues may attract some esteem also to his imperfections; and, if placed in a conspicuous situation, may render his vices and follies objects of general imitation among the multitude.

"In the reign of Charles II." says Mr. Smith, (*Theory of Moral Sentiments,*) "a degree of licentiousness was deemed the characteristic of a liberal education. It was connected, according to the notions of those times, with generosity, sincerity, magnanimity, loyalty; and proved that the person who acted in this manner was a gentleman, and not a puritan. Severity of manners and regularity of conduct, on the other hand, were altogether unfashionable, and were connected, in the imagination of that age, with cant, cunning, hypocrisy, and low manners. To superficial minds, the vices of the great seem at al times agreeable. They connect them, not only with the splendor of fortune, but with many superior virtues which they ascribe to their superiors; with the spirit of freedom and independency; with frankness, generosity, humanity, and politeness. The virtues of the inferior ranks of people, on the contrary, their parsimonious frugality, their painful industry, and rigid adherence to rules, seem to them mean and disagreeable. They connect them both with the meanness of the station to which these qualities commonly belong, and with many great vices which they suppose usually accompany them; such as an abject, cowardly, ill-natured, lying, pilfering disposition."

The attempt to resolve all our affections and the moral sense into the association of ideas.—The theory which, in the foregoing passages from Hutcheson and Smith, is employed so justly and philosophically to explain the origin of our secondary desires, and to account for some perversions of our moral judgments, has been thought sufficient, by some later writers, to account for the origin of all our active principles without exception. The first of these attempts to extend so very far the application of the doctrine of Association was made by the Reverend Mr. Gay, in a dissertation "concerning the fundamental Principle of Virtue," which is prefixed by Dr. Law to his translation of Archbishop King's essay "on the Origin of Evil." In this dissertation, the author endeavors to show, "that our approbation of morality, and all affections whatsoever, are finally resolvable into reason, pointing out private happiness, and are conversant only about things apprehended to be means tending to this end; and that, wherever this end is not perceived, they are to be accounted for from the association of ideas, and may properly be called *habits.*" The same principles have been since pushed to a much greater length by Dr. Hartley, whose system (as he himself informs us) took rise from his accidentally hearing it mentioned as an opinion of Mr. Gay, "that the association of ideas was sufficient to account for all our intellectual pleasures and pains." *

It must, I think, in justice, be acknowledged, that this theory, concerning the origin of our affections and of the moral sense, is a most ingenious refinement upon *the selfish system,* as it was formerly taught; and that, by means of it, the force of many of the common reasonings against that system is eluded. Among these reasonings, particular stress has always been laid on *the instantaneousness* with which our affections operate, and the moral sense approves or condemns; and on our total want of consciousness, in such cases, of any reference to our own happiness. The modern advocates for the selfish system admit the fact to be as it is stated by their opponents; and grant, that *after the moral sense and our various affections are formed,* their exercise, in particular cases, may become completely disinterested; but still they contend, that it is upon a regard to our own happiness that all these principles are originally grafted. The analogy of avarice will serve to illustrate the scope of this theory It cannot be doubted that this principle of action is artificial. It is on account of the enjoyments which it enables us to purchase, that money is originally desired; and yet, in process of time, by means of the agreeable impressions which are associated with it, it comes to be desired for its own sake; and even continues to be an object of our pursuit, long after we have lost all relish for those enjoyments which it enables us to command.

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* Mr. Hume, too, who in my opinion has carried this principle of the association of ideas a great deal too far, has compared the universality of its applications in the philosophy of mind, to that of the principle of attraction in physics. "Here," says he, "is a kind of attraction, which in the mental world will be found to have as extraordinary effects as in the natural, and to show itself in as many and as various forms."

Without meaning to engage in any controversy on the subject, I shall content myself with observing, in general, that there must be some limit, beyond which the theory of association cannot possibly be carried; for the explanation which it gives, of the formation of new principles of action, proceeds on the supposition that there are *other principles previously existing* in the mind. The great question then is, when we are arrived at this limit, or, in other words, when we are arrived at the simple and original laws of our constitution.

Number of original principles in the mind.—In conducting this inquiry, philosophers have been apt to go into extremes. Lord Kaimes, and some other authors, have been censured, and perhaps justly, for a disposition to multiply original principles to an unnecessary degree. It may be questioned, whether Dr. Hartley and his followers have not sometimes been misled by too eager a desire of abridging their number.

Of these two errors, the former is the least common, and the least dangerous. It is the least common, because it is not so flattering as the other to the vanity of a theorist; and it is the least dangerous, because it has no tendency, like the other, to give rise to a suppression or to a misrepresentation of facts; or to retard the progress of the science, by bestowing upon it an appearance of systematical perfection, to which, in its present state, it is not entitled.

Abstracting, however, from these inconveniences, which must always result from a precipitate reference of phenomena to general principles, it does not seem to me, that the theory in question has any tendency to weaken the foundation of morals. It has, indeed, some tendency, in common with the philosophy of Hobbes and of Mandeville, to degrade the dignity of human nature; but it leads to no skeptical conclusions concerning the rule of life. For although we were to grant, that all our principles of action are acquired; so striking a difference among them must still be admitted, as is sufficient to distinguish clearly those universal laws which were intended to regulate human conduct, from the local habits which are formed by education and fashion. It must still be admitted, that, while some active principles are confined to particular individuals, or to particular tribes of men, there are others, which, arising from circumstances in which all the situations of mankind must agree, are common to the whole species. Such active principles as fall under this last description, at whatever period of life they may appear, are to be regarded as a part of human nature, no less than the instinct of suction; in the same manner as the acquired perception of distance by the eye, is to be ranked among the perceptive powers of man, no less than the original perceptions of any of our other senses.

Leaving, therefore, the question concerning the origin of our active principles and of the moral faculty, to be the subject of future discussion, I shall conclude this Section with a few remarks of a more practical nature.

Opinion of the relative value of different pursuits.—It has been shown by different writers, how much of the beauty and sublimity of material objects arise from the ideas and feelings which we have been taught to associate with them. The impression produced on the external senses of a poet by the most striking scene in nature, is precisely the same with what is produced on the senses of a peasant or a tradesman; yet how different is the degree of pleasure resulting from this impression! A great part of this difference is undoubtedly to be ascribed to the ideas and feelings which the habitual studies and amusements of the poet have associated with his organical perceptions.

A similar observation may be applied to all the various objects of our pursuit in life. Hardly any one of them is appreciated by any two men in the same manner; and frequently, what one man considers as essential to his happiness is regarded with indifference or dislike by another. Of these differences of opinion much is, no doubt, to be ascribed to a diversity of constitution, which renders a particular employment of the intellectual or active powers agreeable to one man which is not equally so to another. But much is also to be ascribed to the effect of association; which, prior to any experience of human life, connects pleasing ideas and pleasing feelings with different objects, in the minds of different persons.

In consequence of these associations, every man appears to his neighbor to pursue the objects of his wishes with a zeal disproportioned to its intrinsic value; and the philosopher (whose principal enjoyment arises from speculation) is frequently apt to smile at the ardor with which the active part of mankind pursue what appear to him to be mere shadows. This view of human affairs some writers have carried so far, as to represent life as a scene of mere illusions, where the mind refers to the objects around it, a coloring which exists only in itself; and where, as the poet expresses it,

——" Opinion gilds with varying rays
Those painted clouds which beautify our days."

It may be questioned, if these representations of human life be useful or just. That the casual associations which the mind forms in childhood and in early youth, are frequently a source of inconvenience and of misconduct, is sufficiently obvious; but that this tendency of our nature increases, on the whole, the sum of human enjoyment, appears to me to be indisputable; and the instances in which it misleads us from our duty and our happiness, only prove to what important ends it might be subservient if it were kept under proper regulation.

Nor do these representations of life (admitting them in their full extent) justify the practical inferences which have been often deduced from them with respect to the vanity of our pursuits. In every case, indeed, in which our enjoyment depends upon association, it may be said, in one sense, that it arises from the mind itself; but it does not, therefore, follow, that the external object which custom has rendered the cause or the occasion of agreeable emotions, is indifferent to our happiness. The effect which the beauties of nature produce on the mind of the poet is wonderfully heightened by association ; but his enjoyment is not on that account the less exquisite; nor are the objects of his admiration of the less value to his happiness, that they derive their principal charms from the embellishments of his fancy.

After all the complaints that have been made of the peculiar distresses which are incident to cultivated minds, who would exchange the sensibilities of his intellectual and moral being for the apathy of those whose only avenues of pleasure and pain are to be found in their animal nature; "who move thoughtlessly in the narrow circle of their existence, and to whom the falling leaves present no idea but that of approaching winter?" — *Goethe.*

Effects which education might produce. — It is the business of education, not to counteract, in any instance, the established laws of our constitution, but to direct them to their proper purposes. That the influence of early associations on the mind might be employed, in the most effectual manner, to aid our moral principles, appears evidently from the effects which we daily see it produce, in reconciling men to a course of action which their reason forces them to condemn; and it is no less obvious that by means of it, the happiness of human life might be increased, and its pains diminished, if the agreeable ideas and feelings which children are so apt to connect with events and with situations which depend on the caprice of fortune, were firmly associated in their apprehensions with the duties of their stations, with the pursuits of science, and with those beauties of nature which are open to all.

These observations coincide nearly with the ancient Stoical doctrine concerning the influence of *imagination* * on morals;

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* According to the use which I make of the words *imagination* and *association* in this work, their effects are obviously distinguishable. I have thought it proper, however, to illustrate the difference between them a little more fully.

The difference between the effects of association and of imagination, in a subject on which many important remarks, (though expressed in a form different from that which modern philosophers have introduced, and, perhaps, not altogether so precise and accurate,) are to be found in the Discourses of Epictetus, and in the Meditations of Antoninus. This doctrine of the Stoical school Dr. Akenside has in view in the following passage: —

> *"Action treads the path*
> In which Opinion says he follows good,
> Or flies from evil; and Opinion gives
> Report of good or evil, as the scene

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the sense in which I employ these words, in heightening the pleasure or the pain produced on the mind by external objects, will appear from the following remarks: —

1. As far as the association of ideas operates in heightening pleasure or pain, the mind is *passive:* and accordingly, where such associations are a source of inconvenience, they are seldom to be cured by an effort of our volition, or even by reasoning; but by the gradual formation of contrary associations. Imagination is an *active* exertion of the mind; and although it may often be difficult to restrain it, it is plainly distinguishable in theory from the associations now mentioned.

2. In every case in which the association of ideas operates, it is implied that some pleasure or pain is recalled which was *felt by the mind before.* I visit, for example, a scene where I have been once happy; and the sight of it affects me, on that account, with a degree of pleasure, which I should not have received from any other scene equally beautiful. I shall not inquire, whether, in such cases, the associated pleasure arises immediately upon the sight of the object, and without the intervention of any train of thought; or whether it is produced by the recollection and conception of former occurrences which the perception recalls. On neither supposition does it imply the exercise of that creative power of the mind to which we have given the name of *Imagination.* It is true, that commonly, on such occasions, imagination is busy; and our pleasure is much heightened by the coloring which she gives to the objects of memory. But the difference between the effects which arise from the operation of this faculty, and those which result from association, is not, on that account, the less real.

The influence of imagination on happiness is chiefly felt by *cultivated minds.* That of association extends to *all ranks of men,* and furnishes the chief instrument of education; insomuch that whoever has the regulation of the associations of another from early infancy, is, to a great degree, the arbiter of his happiness or misery.

Some very ingenious writers have employed the word *association* in so

Was drawn by fancy, lovely or deformed:
Thus her report can never there be true,
Where fancy cheats the intellectual eye
With glaring colors and distorted lines.
Is there a man, who at the sound of death
Sees ghastly shapes of terror conjured up,
And black before him: nought but death-bed groans
And fearful prayers, and plunging from the brink
Of light and being, down the gloomy air,
An unknown depth? Alas! in such a mind,
If no bright forms of excellence attend
The image of his country; nor the pomp
Of sacred senates, nor the guardian voice
Of justice on her throne, nor ought that wakes
The conscious bosom with a patriot's flame:
Will not Opinion tell him, that to die,
Or stand the hazard, is a greater ill
Than to betray his country? And in act
Will he not choose to be a wretch and live?
Here vice begins then." —*Pleasures of Imagination*, b. iii.

IV. *General remarks on the subjects treated in the foregoing sections.* — In pursuing the foregoing Sections of this Chapter, I am aware, that some of my readers may be apt to think that many of the observations which I have made, might easily be resolved into more general principles. I am also aware, that to the followers of Dr. Hartley, a similar objection will occur

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extensive a sense, as to comprehend, not only imagination, but all the other faculties of the mind. Wherever the pleasing or the painful effect of an object does not depend solely on the object itself, but arises either wholly or in part from some mental operation to which the perception of it gives rise, the effect is referred to association. And, undoubtedly, this language may be employed with propriety, if the word association be applied to all the ideas and feelings which may arise in the mind, in consequence of the exercise which the sight of the object may give to the imagination, to the reasoning powers, and to the other principles of our nature. But in this work, and particularly in the second part of chap. v., I employ the word *association* in a much more limited sense; to express *the effect which an object derives from ideas, or from feelings which it does not necessarily suggest, but which it uniformly recalls to the mind, in consequence of early and long continued habits.*

against all the other parts of this work; and that it will appear to them the effect of inexcusable prejudice, that I shall stop short so frequently in the explanation of phenomena; when he has accounted in so satisfactory a manner, by means of the association of ideas, for all the appearances which human nature exhibits.

To this objection, I shall not feel myself much interested to reply, provided it be granted that my observations are candidly and accurately stated, so far as they reach. Supposing that in some cases I may have stopped short too soon, my speculations, although they may be censured as imperfect, cannot be considered as standing in opposition to the conclusions of more successful inquirers.

May I be allowed further to observe, that such views of the human mind as are contained in this work, (even supposing the objection to be well founded,) are, in my opinion, indispensably necessary, in order to prepare the way for those very general and comprehensive theories concerning it, which some eminent writers of the present age have been ambitious to form?

Concerning the merit of these theories, I shall not presume to give any judgment. I shall only remark, that, in all the other sciences, *the progress of discovery has been gradual*, from the less general to the more general laws of nature; and that it would be singular, indeed, if in the philosophy of the human mind, a science which but a few years ago was confessedly in its infancy, and which certainly labors under many disadvantages peculiar to itself, a step should, all at once, be made to a single principle comprehending all the particular phenomena which we know.

Particular facts are to be taught first; refined theories afterwards. — Supposing such a theory to be completely established, it would still be proper to lead the minds of students to it by gradual steps. One of the most important uses of theory, is to give the memory a permanent hold, and a prompt command, of the particular facts which we were previously acquainted with; and no theory can be completely understood, unless the mind be led to it nearly in the order of investigation.

It is more particularly useful, in conducting the studies of others, to familiarize their minds, as completely as possible, with those laws of nature for which we have the direct evidence of sense, or of consciousness, before directing their inquiries to the more abstruse and refined generalizations of speculative curiosity. In natural philosophy, supposing the theory of Boscovich to be true, it would still be proper, or rather indeed absolutely necessary, to accustom students, in the first stage of their physical education, to dwell on those general physical facts which fall under our actual observation, and about which all the practical arts of life are conversant. In like manner, in the philosophy of mind, there are many general facts for which we have the direct evidence of consciousness. The words, *attention*, *conception*, *memory*, *abstraction*, *imagination*, *curiosity*, *ambition*, *compassion*, *resentment*, express powers and principles of our nature, which every man may study by reflecting on his own internal operations. Words corresponding to these are to be found in all languages, and may be considered as forming the first attempt towards a philosophical classification of intellectual and moral phenomena. Such a classification, however imperfect and indistinct, we may be assured, must have some foundation in nature; and it is at least prudent, for a philosopher to keep it in view as the groundwork of his own arrangement. It not only directs our attention to those facts in the human constitution, on which every solid theory in this branch of science must be founded; but to the facts, which, in all ages, have appeared to the common sense of mankind to be the most striking and important; and of which it ought to be the great object of theorists, not to supersede, but to facilitate the study.

Difficulty of resolving facts into general principles. — There is indeed good reason for believing, that many of the facts which our consciousness would lead us to consider, upon a superficial view, as ultimate facts, are resolvable into other principles still more general. "Long before we are capable of reflection," says Dr. Reid, "the original perceptions and notions of the mind are so mixed, compounded, and decompounded, by habits, associations, and abstractions, that it is extremely difficult for the mind to return upon its own footsteps, and trace back those operations which have employed it since it first began to think and to act." The same author remarks, that, "if we could obtain a distinct and full history of all that hath passed in the mind of a child, from the beginning of life and sensation, till it grows up to the use of reason; how its infant faculties began to work, and how they brought forth and ripened all the various notions, opinions, and sentiments, which we find in ourselves when we come to be capable of reflection; this would be a treasure of Natural History, which would probably give more light into the human faculties than all the systems of philosophers about them, since the beginning of the world." To accomplish an analysis of these complicated phenomena into the simple and original principles of our constitution, is the great object of this branch of philosophy; but, in order to succeed, it is necessary to ascertain facts before we begin to reason, and to avoid generalizing, in any instance, till we have completely secured the ground that we have gained. Such a caution, which is necessary in all the sciences, is, in a more particular manner, necessary here, where the very facts from which all our inferences must be drawn, are to be ascertained only by the most patient attention; and where almost all of them are, to a great degree, disguised; partly by the inaccuracies of popular language, and partly by the mistaken theories of philosophers.

Illustrations drawn from the philosophy of chemistry. — As the order established in the intellectual world seems to be regulated by laws perfectly analogous to those which we trace among the phenomena of the material system; and as in all our philosophical inquiries, (to whatever subject they may relate,) the progress of the mind is liable to be affected by the same tendency to a premature generalization, the following extract from an eminent chemical writer may contribute to illustrate the scope, and to confirm the justness, of some of the foregoing reflections.

"Within the last fifteen or twenty years, several new metals and new earths have been made known to the world. The names that support these discoveries are respectable, and the experiments decisive. If we do not give our assent to them, no single proposition in chemistry can for a moment stand. But whether all these are really simple substances, or compounds not yet resolved into their elements, is what the authors themselves cannot possibly assert; nor would it in the least diminish the merit of their observations, if future experiment should prove them to have been mistaken as to the simplicity of these substances. This remark should not be confined to late discoveries; it may as justly be applied to those earths and metals with which we have been long acquainted."—"In the dark ages of chemistry, the object was to rival nature; and the substance which the adepts of those days were busied to create, was universally allowed to be simple. In a more enlightened period, we have extended our inquiries, and multiplied the number of the elements. The last task will be to simplify; and, by a closer observation of nature, to learn from what small store of primitive materials, all that we behold and wonder at was created." Chenevix' *Inquiries concerning Palladium.*

The analogy between the history of Chemistry and that of the Philosophy of the Human Mind, which has often struck me in contrasting the views of the alchemist with those of Lavoisier and his followers, has acquired much additional value and importance in my estimation, since I had the pleasure to peruse a late work of M. de Gerando; in which I find, that the same analogy has presented itself to that most judicious philosopher, and has been applied by him to the same practical purpose, of exposing the false pretensions and premature generalizations of some modern metaphysicians.

"It required nothing less than the united splendor of the discoveries brought to light by the new chemical school, to tear the minds of men from the pursuit of *a simple and primary element;* a pursuit renewed in every age with an indefatigable perseverance, and always renewed in vain. With what feelings of contempt would the physiologists of former times have looked down on the chemists of the present age, whose limited and circumscribed system admits nearly forty different *principles* in the composition of bodies! What a subject of ridicule would the new nomenclature have afforded to an alchemist!"

"The Philosophy of Mind has its alchemists also: — men whose studies are directed to the pursuit of one single principle, into which the whole science may be resolved, and who flatter themselves with the hope of discovering the grand secret, by which the pure Gold of Truth may be produced at pleasure."

Among these alchemists in the science of the mind, the first place is undoubtedly due to Dr. Hartley, who not only attempts to account for all the phenomena of human nature from the single principle of *association*, combined with the *hypothetical* assumption of an invisible fluid or *ether*, producing vibrations in the medullary substance of the brain and nerves; but indulges his imagination in anticipating an era, "when future generations shall put all kinds of evidences and inquiries into mathematical forms; reducing Aristotle's ten Categories and Bishop Wilkins' forty *Summa Genera*, to the head of quantity alone, so as to make Mathematics and Logic, Natural History and Civil History, Natural Philosophy and philosophy of all other kinds, coincide *omni ex parte*." If I had never read another sentence of this author, I should have required no further evidence of the unsoundness of his understanding.

The nomenclature of philosophy. — I have only to add, that, although I have retained the phrase of *the association of ideas*, in compliance with common language, I am far from being completely satisfied with this mode of expression. I have retained it, chiefly that I might not expose myself to the censure of delivering old doctrines in a new form.

As I have endeavored to employ it with caution, I hope that it has not often misled me in my reasonings. At the same time, I am more and more convinced of the advantages to be derived from a reformation of the common language, in most of the branches of science. How much such a reformation has effected in Chemistry is well known; and it is evidently much more necessary in the Philosophy of Mind, where the prevailing language adds to the common inaccuracies of popular expressions, the peculiar disadvantage of being all suggested by the analogy of matter. Often, in the composition of this work, have I recollected the advice of Bergman to Morveau: "In reforming the nomenclature of Chemistry, spare no word which is improper. They who understand the subject already, will suffer no inconvenience; and they to whom the subject is new, will comprehend it with the greater facility." But it belongs to such authors alone as have extended the boundaries of science by their own discoveries, to introduce innovations in language with any hope of success.

CHAPTER VI.

OF MEMORY.

I. *General observations on Memory.*—Among the various powers of the understanding, there is none which has been so attentively examined by philosophers, or concerning which so many important facts and observations have been collected, as the faculty of Memory. This is partly to be ascribed to its nature, which renders it *easily distinguishable from all the other principles* of our constitution, even by those who have not been accustomed to metaphysical investigations; and partly to its *immediate subserviency*, not only to the pursuits of science, but *to the ordinary business of life;* in consequence of which, many of its most curious laws had been observed, long before any analysis was attempted of the other powers of the mind, and have, for many ages, formed a part of the common maxims which are to be found in every treatise of education. Some important remarks on the subject may, in particular, be collected from the writings of the ancient rhetoricians.

Different significations of Memory.—The word Memory is not employed uniformly in the same precise sense; but it always expresses some modification of that faculty, which enables us to treasure up and preserve for future use the knowledge we acquire,—a faculty which is obviously the great foundation of all intellectual improvement, and without which no advantage could be derived from the most enlarged experience. This faculty implies *two* things, — *a capacity of retaining knowledge, and a power of recalling it to our thoughts* when we have occasion to apply it to use. The word Memory is sometimes employed to express the *capacity*, and sometimes the *power*. When we speak of a *retentive* Memory, we use it in the former sense; when of a *ready* Memory, in the latter.

The various particulars which compose our stock of knowledge are, from time to time, recalled to our thoughts in one of two ways; sometimes they recur to us *spontaneously*, or at least, without any interference on our part; in other cases, they are recalled in consequence of *an effort of our will*. For the former operation of the mind, we have no appropriated name in our language distinct from Memory. The latter, too, is often called by the same name, but is more properly distinguished by the word *recollection*.

There are, I believe, some other acceptations besides these, in which the word Memory has been occasionally employed; but as its ambiguities are not of such a nature as to mislead us in our present inquiries, I shall not dwell any longer on the illustration of distinctions, which, to the greater part of readers, might appear uninteresting and minute.* One distinction only relative to this subject occurs to me as deserving particular attention.

Memory involves an idea of the past. — The operations of

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* In the French tongue, there are several words connected with this operation of the mind, marking nice shades of meaning, which cannot be expressed in our language without circumlocution. Such (according to Girard) are the words *Mémoire* and *Souvenir*, the former referring to the understanding alone, the latter, to things which also touch or affect the heart. This distinction was plainly in the view of Diderot, in a passage which it is scarcely possible to translate into English without impairing somewhat of the beauty of the original. "Rapportez tout au dernier moment; à ce moment où la mémoire des faits les plus êclatants ne vaudra pas le souvenir d'un verre d'eau présenté par humanité à celui qui avoit soif."

Memory relate either to things and their relations, or to events. In the former case, thoughts which have been previously in the mind may recur to us *without suggesting the idea of the past*, or of any modification of time whatever; as when I repeat over a poem which I have got by heart, or when I think of the features of an absent friend. In this last instance, indeed, philosophers distinguish the act of the mind by the name of *conception;* but in ordinary discourse, and frequently even in philosophical writing, it is considered as an exertion of Memory. In these and similar cases, it is obvious, that the operations of this faculty do not necessarily involve the idea of the past.

The case is different with respect to the Memory of events. When I think of these, I not only recall to the mind the former objects of its thoughts, but I refer the event to a particular point of time; so that, of every such act of Memory, *the idea of the past is a necessary concomitant.*

I have been led to take notice of this distinction, in order to obviate an objection which some of the phenomena of Memory seem to present, against a doctrine which I formerly stated, when treating of the powers of conception and imagination.

How conception passes into, or becomes, Memory.—It is evident that, when I think of an event, in which any object of sense was concerned, my recollection of the event must necessarily involve an act of *conception.* Thus, when I think of a dramatic representation which I have recently seen, my recollection of what I saw, necessarily involves a conception of the different actors by whom it was performed. But every act of recollection which relates to events, is accompanied with a belief of their *past* existence. How then are we to reconcile this conclusion with the doctrine formerly maintained concerning conception, according to which, every exertion of that power is accompanied with a belief that its object exists before us *at the present moment?*

The only way that occurs to me of removing this difficulty, is by supposing, that the remembrance of a past event is *not a simple act of the mind;* but that the mind *first* forms a conception of the event, and *then* judges from circumstances of the period of time to which it is to be referred; a supposition which is by no means a gratuitous one, invented to answer a particular purpose; but which, as far as I am able to judge, is agreeable to fact; for if we have the power, as will not be disputed, of conceiving a past event without any reference to time, it follows, that there is nothing in the ideas or notions which Memory presents to us, which is necessarily accompanied with a belief of past existence, in a way analogous to that in which our perceptions are accompanied with a belief of the present existence of their objects; and, therefore, that the reference of the event to the particular period at which it happened, is a judgment founded on concomitant circumstances. So long as we are occupied with the conception of any particular object connected with the event, we believe the present existence of the object; but this belief, which, in most cases, is only momentary, is instantly corrected by habits of judging acquired by experience; and as soon as the mind is disengaged from such a belief, it is left at liberty to refer the event to the period at which it actually happened. Nor will the apparent instantaneousness of such judgments be considered as an unsurmountable objection to the doctrine now advanced, by those who have reflected on the perception of distance obtained by sight, which, although it seems to be as immediate as any perception of touch, has been shown by philosophers to be the result of a judgment founded on experience and observation. The reference we make of past events to the particular points of time at which they took place, will, I am inclined to think, the more we consider the subject, be found the more strikingly analogous to the estimates of distance we learn to form by the eye.

Although, however, I am, myself, satisfied with the conclusion to which the foregoing reasonings lead, I am far from expecting that the case will be the same with all my readers. Some of their objections, which I can easily anticipate, might, I believe, be obviated by a little further discussion; but as the question is merely a matter of curiosity, and has no necessary connection with the observations I am to make in this chapter, I shall not prosecute the subject at present. The opinion, indeed, we form concerning it, has no reference to any of the doctrines maintained in this work, excepting to a particular speculation concerning the belief accompanying *conception*, which I ventured to state in treating of that subject, and which, as it appears to be extremely doubtful to some whose opinions I respect, I proposed with a degree of diffidence suitable to the difficulty of such an inquiry. The remaining observations which I am to make on the power of *Memory*, whatever opinion may be formed of their importance, will furnish but little room for a diversity of judgment concerning their truth.

Why we remember some things better than others. — In considering this part of our constitution, one of the most obvious and striking questions that occurs, is, what the circumstances are which determine the Memory to retain some things in preference to others? Among the subjects which successively occupy our thoughts, by far the greater number vanish without leaving a trace behind them; while others become, as it were, a part of ourselves, and, by their accumulations, lay a foundation for our perpetual progress in knowledge. Without pretending to exhaust the subject, I shall content myself at present with a partial solution of this difficulty, by illustrating the dependence of Memory upon two principles of our nature, with which it is plainly very intimately connected; *attention* and *the association of ideas.*

I endeavored in a former chapter to show, that there is a certain act of the mind, (distinguished, both by philosophers and the vulgar, by the name of *attention,*) without which even the objects of our perceptions make no impression on the Memory. It is also matter of common remark, that the permanence of the impression which any thing leaves in the Memory, is proportioned to the degree of attention which was originally given to it. The observation has been so often repeated, and is so manifestly true, that it is unnecessary to offer any illustration of it.*

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* It seems to be owing to this dependence of memory on attention, that it is easier to get by heart a composition after a very few readings, with

Attention sometimes spontaneous, and sometimes requires effort. — I have only to observe further, with respect to *attention*, considered in the relation in which it stands to Memory, that although it be a voluntary act, *it requires experience to have it always under command.* In the case of objects to which we have been taught to attend at an early period of life, or which are calculated to rouse the curiosity, or to affect any of our passions, the attention fixes itself upon them, as it were spontaneously, and without any effort on our part, of which we are conscious. How perfectly do we remember, and even retain, for a long course of years, the faces and the handwritings of our acquaintances, although we never took any particular pains to fix them in the Memory? On the other hand, if an object does not interest some principle of our nature, we may examine it again and again, with a wish to treasure up the knowledge of it in the mind, without our being able to command that degree of attention which may lead us to recognize it the next time we see it. A person, for example, who has not been accustomed to attend particularly to horses or to cattle, may study for a considerable time the appearance of a horse or of a bullock, without being able, a few days afterwards, to pronounce on his identity; while a horse-dealer or a grazier recollects many hundreds of that class of animals with which he is conversant, as perfectly as he does the faces of his acquaintances. In order to account for this, I would remark, that although attention be a voluntary act, and although we are always able, when we choose, to make a momentary exertion of it; yet, unless the object to which it is directed be really interesting, in some degree, to the

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an attempt to repeat it at the end of each, than after a hundred readings without such an effort. The effort rouses the attention from that languid state in which it remains, while the mind is giving a passive reception to foreign ideas. The fact is remarked by Lord Bacon, and is explained by him on the same principle to which I have referred it.

"Quæ expectantur et attentionem excitant, melius hærent quam quæ prætervolant. Itaque si scriptum aliquod vicies perlegeris, non tam facile illud memoriter disces, quam si illud legas decies, tentando interim illud recitare, et ubi deficit memoria, inspiciendo librum." — Bacon, Nov. Org. lib. ii. aph. 26.

curiosity, the train of our ideas goes on, and we immediately forget our purpose. When we are employed, therefore, in studying such an object, it is not an exclusive and steady attention that we give to it, but we are losing sight of it, and recurring to it every instant; and the painful efforts of which we are conscious, are not, (as we are apt to suppose them to be,) efforts of uncommon attention, but unsuccessful attempts to keep the mind steady to its object, and to exclude the extraneous ideas, which are from time to time soliciting its notice.

If these observations be well founded, they afford an explanation of a fact which has often been remarked, that objects are easily remembered which affect any of the passions.* The passion assists the Memory, not in consequence of any immediate connection between them, but as it presents, during the time it continues, a steady and exclusive object to the attention.

The connection between Memory and the association of ideas, is so striking, that it has been supposed by some, that the whole of its phenomena might be resolved into this principle. But this is evidently not the case. The association of ideas connects our various thoughts with each other, so as to present them to the mind in a certain order; but it presupposes the existence of these thoughts in the mind; or, in other words, it presupposes a faculty of retaining the knowledge which we acquire. It involves, also, a power of recognizing, as former objects of attention, the thoughts that from time to time occur to us; a power which is not implied in that law of our nature which is called the association of ideas. It is possible, surely, that our thoughts might have succeeded each other, according to the same laws as at present, without suggesting to us at all the idea of the past; and, in fact, this supposition is realized to a certain degree in the case of some old men, who retain pretty exactly the information which they receive, but are sometimes unable to recollect in what manner the particulars which they find connected together in their thoughts, at first came into the mind; whether they occurred to them in a dream, or were communicated to them in conversation.

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* "Si quas res in vita videmus, parvas, usitatas, quotidianas, eas meminisse non solemus; propterea quod nulla nisi nova aut admirabili re commovetur animus. At si quid videmus aut audimus egregie turpe, aut honestum, inusitatum, magnum, incredibile, ridiculum, id diu meminisse consuevimus." [When we witness things that are small, common, and of daily recurrence, we do not usually remember them; for the mind is not stirred except by something new and wonderful. But if we see or hear any thing remarkably base, honorable, unusual, great, incredible, or ridiculous, it generally remains long in the memory.] — Ad. Herenn, lib. 3.

On the other hand, it is evident, that without the associating principle, the powers of retaining our thoughts, and of recognizing them when they occur to us, would have been of little use; for the most important articles of our knowledge might have remained latent in the mind, even when those occasions presented themselves to which they are immediately applicable. In consequence of this law of our nature, not only are all our various ideas made to pass, from time to time, in review before us, and to offer themselves to our choice as subjects of meditation, but when an occasion occurs which calls for the aid of our past experience, the occasion itself recalls to us all the information upon the subject which that experience has accumulated.

The foregoing observations comprehend an analysis of Memory sufficiently accurate for my present purpose; some other remarks, tending to illustrate the same subject more completely, will occur in the remaining sections of this chapter.

Memory itself is an ultimate and inexplicable fact.—It is hardly necessary for me to add, that when we have proceeded so far in our inquiries concerning Memory, as to obtain an analysis of that power, and to ascertain the relation in which it stands to the other principles of our constitution, we have advanced as far towards an explanation of it as the nature of the subject permits. The various theories which have attempted to account for it by traces or impressions in the sensorium, are obviously too unphilosophical to deserve a particular refutation.*

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* The following passage from Malebranche will be a sufficient specimen of the common theories with respect to memory.

"In order to give an explanation of memory, it should be called to mind, that all our different perceptions are affixed to the changes which

Such, indeed, is the poverty of language, that we cannot speak on the subject without employing expressions which suggest one theory or another; but it is of importance for us always to recollect, that these expressions are entirely figurative, and afford no explanation of the phenomena to which they refer. It is partly

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happen to the fibres of the principal parts of the brain, wherein the soul particularly resides.

"This supposition being laid down, the nature of the memory is explained; for as the branches of a tree, which have continued some time bent after a particular manner, preserve a readiness and facility of being bent afresh in the same manner; so the fibres of the brain, having once received certain impressions from the current of the animal spirits, and from the action of the objects upon them, retain for a considerable time some facility of receiving the same dispositions. Now the memory consists only in that promptness or facility; since a man thinks upon the same things, whenever the brain receives the same impressions." — Book ii. chap. v.

The different changes which this power of the mind undergoes, in the course of our progress through life, are explained by some other writers by means of the following hypothesis. "The mind," we are told, "is like wax, which may be softened too much to retain, or too little to receive, an impression. In childhood, the material is too soft, and gives way to impressions, but does not retain them. In old age, it is hard, and retains the impressions formerly made, but does not receive any new ones. In manhood, the consistence is at once proper to receive and to retain the impressions which are made upon it." I quote the last sentences on the authority of Dr. Ferguson, as I don't know from what writer they are taken. In the main, the theory here described agrees with that of Aristotle.

The habitual use we make of the art of printing and of writing, in the acquisition and in the preservation of our knowledge, is apt to predispose the understanding in favor of this last theory. We conceive *the memory* in particular (not unnaturally, I own, upon a superficial view of the subject) to be analogous to *a tablet*, on which certain traces are left; by recurring to which, the mind can, as it were, *read*, without any fresh aids from without, the recorded results of its former experience or reflection.

Admitting, for a moment, the existence of these impressions, the question still recurs, what is the nature of that thinking and percipient being which *reads* the impressions, and avails itself of their aid in the exercise of its various difficulties? Who taught the mind to interpret their import, and to annex to them notions as foreign to themselves, as alphabetical characters are to the information which they convey? Even upon this supposition, therefore, the mystery is not less astonishing than if a child, with a view to remind my readers of this consideration, that, finding it impossible to lay aside completely metaphorical or

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without any instructions, were to read a book, the first time it was put into his hands, with a full comprehension of the author's meaning.

But what I wish chiefly to insist on at present, is the obviously illogical inference which so many ingenious men seem to have been disposed to draw from the *supposed* impressions on the *material* substance of the brain, against the *immateriality* of that being (that thinking and percipient *I*) which reads and interprets these impressions. If the hypothesis which forms the foundation of this argument be true, all that follows from it is, that, in the operations of perception and of memory, a process is carried on by the mind in the dark recesses of the brain, analogous to what takes place when it reads, by the intervention of the eye, the characters of a book. The question (it ought always to be remembered) is not about the nature of *the thing read*, but about the nature of *the reader*. In the case of the book, no one thinks of identifying the reader's mind with the texture of the paper, or with the chemical composition of the ink. Why then should it be imagined, that any step is made towards materialism by *supposing* that an invisible book exists in the *sensorium*, by the interpretation of which we are enabled to *perceive* external objects; and, by a reference to which, we recover, as in a tablet, the knowledge which has happened to escape from the memory?

[To the hypothesis that memory takes place through the impressions which are left upon the brain, Dr. Reid justly objects, "that there is no evidence nor probability that the cause assigned does exist; that is, that the impression made upon the brain in perception *remains after the object is removed.*" Still further; if the impression be the cause of memory, so long as the cause continues, the effect ought to continue also; that is, the idea should never fade or disappear from the mind, but the memory, or rather the perception, should be continuous. I saw a particular horse yesterday; and the impression made upon my brain by that perception, according to this hypothesis, is the cause of my remembrance of that horse. Then, as the impression left upon the brain must have lasted through the interval from yesterday till to-day, I ought never to have forgotten the horse, but the idea or recollection of it should have been constantly present to my mind. It should have been, not memory, but continuous perception, though growing fainter and fainter every moment, as the impression was gradually effaced. But this is not the case. Some accidental circumstance may suddenly recall to mind a person whom I had neither seen nor thought of for many years. Where was the impression of his face upon my brain during these intervening years? If it remained there, why did I ever forget him? — why did I ever cease to see him?]

analogical words, I have studied to avoid such an uniformity in the employment of them, as might indicate a preference to one theory rather than another; and, by doing so, have perhaps sometimes been led to vary the metaphor oftener and more suddenly, than would be proper in a composition which aimed at any degree of elegance. This caution in the use of the common language concerning Memory, it seemed to me the more necessary to attend to, that the general disposition which every person feels at the commencement of his philosophical pursuits, to explain the phenomena of thought by the laws of matter, is, in the case of this particular faculty, encouraged by a variety of peculiar circumstances. The analogy between committing a thing to Memory that we wish to remember, and engraving on a tablet a fact that we wish to record, is so striking as to present itself even to the vulgar; nor is it perhaps less natural to indulge the fancy in considering Memory as *a sort of repository*, in which we arrange and preserve for future use the materials of our information. The immediate dependence, too, of this faculty on the state of the body, which is more remarkable than that of any other faculty whatever, (as appears from the effects produced on it by old age, disease, and intoxication,) is apt to strike those who have not been much conversant with these inquiries, as bestowing some plausibility on the theory which attempts to explain its phenomena on mechanical principles.

Effects of disease and old age on Memory.—I cannot help taking this opportunity of expressing a wish, that medical writers would be at more pains than they have been at hitherto, to ascertain the various effects which are produced on the Memory by disease and old age. These effects are widely diversified in different cases. In some, it would seem that the Memory is impaired in consequence of *a diminution of the power of attention;* in others, that the power of recollection is disturbed in consequence of *a derangement of* that part of the constitution on which *the association of ideas.* depends. The decay of Memory, which is the common effect of age, seems to arise from the former of these causes. It is probable, that, as we advance in years, the capacity of attention is weakened by some physical change in the constitution; but it is also reasonable to think, that it loses its vigor partly from the effect which the decay of our sensibility and the extinction of our passions have, in diminishing the interest which we feel in the common occurrences of life. That no derangement takes place, in ordinary cases, in that part of the constitution on which the association of ideas depends, appears from the distinct and circumstantial recollection which old men retain of the transactions of their youth.* In some diseases, this part of the constitution is evidently affected. A stroke of the palsy has been known, while it did not destroy the power of speech, to render the patient incapable of recollecting the names of the most familiar objects. What is still more remarkable, the *name* of an object has been known to suggest the idea of it as formerly, although the *sight* of the object ceased to suggest the name. Something similar to this last fact (it may not be improper here to remark) occurs in an inferior degree, in the case of most old men, even when they do not labor under any specific disease. When the faculty of Memory begins to decline, the first symptom of its failure is, in ordinary cases, a want of recollection of *words*; first, of *proper names and dates*, and afterwards, of *words in general.* The transition from the sign to the thing signified seems, in every case, easier than from the thing signified to the sign; and hence it is, that many persons who are able to *read* a foreign language with ease, are perfectly unable to express themselves in that language in *conversation*, or even in *writing*. Of this fact, some explanation may be given, without having recourse to any physiological consideration; for we are accustomed to pass from the sign to the thing signified every time we read a book, or listen to the conversation of another person; whereas we pass from the thing signified to the sign, only when we have occasion to communicate our own ideas to others: And cases of this last sort bear (it is evident) no proportion, in point of number, to the former. With respect to our peculiar tendency to forget *proper names*, when the memory begins to be impaired, the fact seems to be owing: 1. To the firmer hold which *general words* take of the mind, in consequence of their smaller number: 2. To the exercise which our recollection of general words is constantly receiving in the course of our *solitary* speculation; for (as was formerly shown) we can carry on *general* reasonings by means of language only; whereas, when we speculate concerning *individuals*, we frequently fix our thoughts on the object itself, without thinking of the name.*

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* Swift somewhere expresses his surprise, that old men should remember their anecdotes so distinctly, and should, notwithstanding, have so little memory as to tell the same story twice in the course of the same conversation; and a similar remark is made by Montaigne, in one of his Essays.

The fact seems to be, that all their old ideas remain in the mind, connected as formerly by the different associating principles; but that the power of attention to new ideas and new occurrences is impaired.

Instances of this are so common, that there can be no dispute about the fact. At the same time, I agree with Dr. Hartley in thinking, that old men do not *always* recollect the events of their youth so distinctly as we might at first conclude from their narratives; and that it is rather *their own narratives* that they remember, than the events to which they relate.

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* "Slight paralytic affections of the organs of speech sometimes occur without any correspondent disorder in other parts of the body. In such cases, the tongue appears to the patient too large for his mouth, — the saliva flows more copiously than usual, — and the vibratory power of the *glottis* is somewhat impaired. Hence the effort to speak succeeds the volition of the mind slowly and imperfectly, and the words are uttered with faltering and hesitation. These are facts of common notoriety; but I have never seen it remarked, that in this local palsy, the pronunciation of PROPER NAMES is attended with peculiar difficulty, and that the recollection of them becomes either very obscure, or entirely obliterated; whilst that of persons, places, things, and even of abstract ideas, remains unchanged. Such a partial defect of memory, of which experience has furnished me with several examples, confirms the theory of association, and at the same time admits of an easy solution by it. For as words are arbitrary marks, and owe their connection with what they import to established usage, the strength of this connection will be exactly proportioned to the frequency of their recurrence; and this recurrence must be much more frequent with generic than with specific terms. Now, proper names are of the latter class; and the idea of a person or place may remain vivid in the mind, without the least signature of the appellative which distinguishes each of

I shall only add further on this head, that, as far as my own personal observations have extended, the forgetfulness of proper names incident to old men, is chiefly observable in men of science, or in those who are habitually occupied with important affairs; and this, I apprehend, is what might reasonably have been expected *a priori;* partly from their habits of general thought, and partly from their want of constant practice in that trivial conversation which is every moment recalling particulars to the mind.

In endeavoring thus to account, from the general laws of our constitution, for *some* of the phenomena which are commonly referred immediately to *physical changes in the brain,* I would not be understood to deny, that age often affects the memory through the medium of the body. This, indeed, is one of those melancholy truths to which every day's experience bears witness. It is beautifully and pathetically stated by Locke in the following words: "The pictures drawn in our minds are laid in fading colors, and, if not sometimes refreshed, vanish and disappear. Thus the ideas, as well as children, of our youth, often die before us; and our minds represent to us those tombs to which we are approaching; where, though the brass and marble remain, yet the inscriptions are effaced by time, and the imagery moulders away." *

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them. It is certain, also, that we often think in words; and there is probably, at such times, some slight impulse on the organs of speech, analogous to what is perceived when a musical note or tune is called to mind. But a lesion of the power of utterance may break a link in the chain of association, and thus add to the partial defect of memory now under consideration." — (*Percival's Works,* Vol. II. p. 73.)

* In ordinary cases, I confess, I strongly suspect that the physical effects of old age on this part of our constitution are not so great as is commonly imagined; and that much of what is generally imputed to advanced years, may be fairly ascribed to a disuse of the faculty, occasioned by a premature retreat from the business of the world. One thing is certain (as Cicero has remarked) that those old men who have force of mind to keep up their habits of activity to the last, are, in most cases, distinguished by a strength of memory unusual at their years; to which I may add, that this faculty, after a temporary decline, frequently recovers a great deal of its former vigor.

"I never yet heard of any old man," says Cicero, in the character of

The decay of Memory may be averted or postponed by our own efforts. — In so far as this decay of Memory which old age brings along with it, is a necessary consequence of a physical change in the constitution, or a necessary consequence of a diminution of sensibility, it is the part of a wise man to submit cheerfully to the lot of his nature. But it is not unreasonable to think, that something may be done by our own efforts, to obviate the inconveniences which commonly result from it. If individuals, who, in the early part of life, have weak memories, are sometimes able to remedy this defect, by a greater attention to arrangement in their transactions, and to classification among their ideas, than is necessary to the bulk of mankind, might it not be possible, in the same way, to ward off, at least to a certain degree, the encroachments which time makes on this faculty? The few old men who continue in the active scenes of life to the last moment, it has been often remarked, complain, in general, much less of a want of recollection than their contemporaries. This is undoubtedly owing, partly, to the effect which the pursuits of business must necessarily have, in keeping alive the power of attention. But it is probably owing also to new habits of arrangement, which the mind gradually and insensibly forms, from the experience of its growing infirmities. The apparent revival of Memory in old men, after a temporary decline, which is a case that happens not unfrequently, seems to favor this supposition.

Cato, " whose memory was so weakened by time, as to forget where he had concealed his treasure. The aged seem, indeed, to be at no loss in remembering whatever is the principal object of their attention; and few there are at that period of life who cannot tell what recognizances they have entered into, or with whom they have had any pecuniary transactions. Innumerable instances of a strong memory in advanced years might be produced from among our celebrated lawyers, pontiffs, augurs, and philosophers; for the faculties of the mind will preserve their powers in old age, unless they are suffered to lose their energy, and become languid for want of due cultivation."

—— " The mind and body equally thrive by a suitable exertion of their powers, with this difference, however, that bodily exercise ends in fatigue, whereas the mind is never wearied in its activity. When Cæcilius there-

One old man, I have, myself, had the good fortune to know, who, after a long, an active, and an honorable life, having begun to feel some of the usual effects of advanced years, has been able to find resources in his own sagacity, against most of the inconveniences with which they are commonly attended; and who, by watching his gradual decline with the cool eye of an indifferent observer, and employing his ingenuity to retard its progress, has converted even the infirmities of age into a source of philosophical amusement.

II. *Of the varieties of Memory in different individuals.* — It is generally supposed, that, of all our faculties, Memory is that which nature has bestowed in the most unequal degrees on different individuals; and it is far from being impossible, that this opinion may be well founded. If, however, we consider, that there is scarcely any man who has not Memory sufficient to learn the use of language, and to learn to recognize, at the first glance, the appearances of an infinite number of familiar objects; besides acquiring such an acquaintance with the laws of nature, and the ordinary course of human affairs, as is necessary for directing his conduct in life; we shall be satisfied that the original disparities among men, in this respect, are by no means so immense as they seem to be at first view; and that much is to be ascribed to different habits of attention, and to a difference

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fore represents certain veterans as fit subjects for the Comic Muse, he alludes only to those weak and credulous dotards, whose infirmities of mind are not so much the natural effects of their years, as the consequence of suffering their faculties to lie dormant and unexerted in a slothful and spiritless inactivity." — *Melmoth's Translation of Cicero on Old Age.*

Among the practices to which Cato had recourse for exercising his memory, he mentions his observance of the Pythagorean rule, in recalling every night, all that he had said, or done, or heard the preceding day: — And, perhaps, few rules could be prescribed of greater efficacy for fixing in the mind the various ideas which pass under its review, or for giving it a ready and practical command of them. Indeed, this habit of frequently reviewing the information we possess, either in our solitary meditations, or (which is still better) in our conversations with others, is the most effectual of all the helps to memory that can possibly be suggested. But these remarks properly belong to another branch of our subject.

of selection among the various objects and events presented to their curiosity.

It is worthy of remark, also, that those individuals who possess unusual powers of Memory with respect to any one class of objects, are commonly as remarkably deficient in some of the other applications of that faculty. I knew a person who, though completely ignorant of Latin, was able to repeat over thirty or forty lines of Virgil, after having heard them once read to him, — not indeed with perfect exactness, but with such a degree of resemblance as (all circumstances considered) was truly astonishing; yet this person (who was in the condition of a servant) was singularly deficient in Memory in all cases in which that faculty is of real practical utility. He was noted in every family in which he had been employed for habits of forgetfulness; and could scarcely deliver an ordinary message without committing some blunder.

A similar observation, I can almost venture to say, will be found to apply to by far the greater number of those in whom this faculty seems to exhibit a preternatural or anomalous degree of force. The *varieties* of memory are indeed wonderful; but they ought not to be confounded with *inequalities* of memory. One man is distinguished by a power of recollecting names, and dates, and genealogies; a second, by the multiplicity of speculations, and of general conclusions, treasured up in his intellect; a third, by the facility with which words and combinations of words (the *ipsissima verba* of a speaker or of an author) seem to lay hold of his mind; a fourth, by the quickness with which he seizes and appropriates the sense and meaning of an author, while the phraseology and style seem altogether to escape his notice; a fifth, by his Memory for poetry; a sixth, by his Memory for music; a seventh, by his Memory for architecture, statuary, and painting, and all the other objects of taste which are addressed to the eye. All these different powers seem miraculous to those who do not possess them; and, as they are apt to be supposed, by superficial observers, to be commonly united in the same individuals, they contribute much to encourage those exaggerated estimates concerning the original inequalities among men in respect to this faculty, which I am now endeavoring to reduce to their just standard.

The characteristics of a good Memory. — As the great purpose to which this faculty is subservient, is to enable us to collect, and to retain, for the future regulation of our conduct, the results of our past experience; it is evident that the degree of perfection which it attains in the case of different persons, must vary, *first*, with the facility of making the original acquisition; *secondly*, with the permanence of the acquisition; and *thirdly*, with the quickness or readiness with which the individual is able, on particular occasions, to apply it to use. The qualities therefore, of a good Memory are, in the first place, to be *susceptible;* secondly, to be *retentive;* and thirdly, to be *ready.*

It is but rarely that these three qualities are united in the same person. We often, indeed, meet with a Memory which is at once *susceptible* and *ready;* but I doubt much, if such memories be commonly very *retentive.* For the same set of habits which are favorable to the two first qualities, are adverse to the third. Those individuals, for example, who, with a view to conversation, make a constant business of informing themselves with respect to the popular topics of the day, or of turning over the ephemeral publications subservient to the amusement or to the politics of the times, are naturally led to cultivate a *susceptibility* and *readiness* of memory, but have no inducement to aim at that *permanent retention of selected ideas*, which enables the scientific student to combine the most remote materials, and to concentrate, at will, on a particular object, all the scattered lights of his experience, and of his reflections. Such men (as far as my observation has reached) seldom possess a familiar or correct acquaintance even with those classical remains of our own earlier writers, which have ceased to furnish topics of discourse to the circles of fashion. A stream of novelties is perpetually passing through their minds; and the faint impressions which it leaves, soon vanish to make way for others, — like the traces which the ebbing tide leaves upon the sand. Nor is this all. In proportion as the associating principles which lay the foundation of susceptibility and readiness predominate in the

Memory, those which form the basis of our more solid and lasting acquisitions may be expected to be weakened, as a natural consequence of the general laws of our intellectual frame. This last observation it will be necessary to illustrate more particularly.

Various modes of association in different minds.—I have already remarked, in treating of a different subject, that the bulk of mankind, being but little accustomed to reflect and to generalize, associate their ideas chiefly according to their *more obvious* relations; those, for example, of *resemblance* and of *analogy;* and above all, according to the casual relations arising from *contiguity in time and place;* whereas, in the mind of a philosopher, ideas are commonly associated according to those relations which are brought to light in consequence of particular efforts of attention; such as the relations of *cause and effect*, or of *premises and conclusion.* This difference in the modes of association of these two classes of men, is the foundation of some very striking diversities between them in respect of intellectual character.

Differences of Memory between philosophers and the vulgar.—In the first place, in consequence of the nature of the relations which connect ideas together in the mind of the philosopher, it must necessarily happen, that when he has occasion to apply to use his acquired knowledge, time and reflection will be requisite to enable him to recollect it. In the case of those, on the other hand, who have not been accustomed to scientific pursuits, as their ideas are connected together according to the most obvious relations, when any one idea of a class is presented to the mind, it is immediately followed by the others, which succeed each other spontaneously, according to the laws of association. In managing, therefore, the little details of some subaltern employment, in which all that is required is knowledge of forms, and a disposition to observe them, the want of a systematical genius is an important advantage; because this want renders the mind peculiarly susceptible of habits, and allows the train of its ideas to accommodate itself perfectly to the daily and hourly occurrences of its situation. But if, in this respect, men of no general principles have an advantage over the philosopher, they fall greatly below him in another point of view; inasmuch as all the information which they possess, must necessarily be limited by their own proper experience; whereas the philosopher, who is accustomed to refer every thing to general principles, is not only enabled, by means of these, to arrange the facts which experience has taught him, but by reasoning from his principles synthetically, has it often in his power to determine facts *à priori*, which he has no opportunity of ascertaining by observation.

It follows further, from the foregoing principles, that the intellectual defects of the philosopher, are of a much more corrigible nature, than those of the mere man of detail. If the former is thrown by accident into a scene of business, more time will perhaps be necessary to qualify him for it, than would be requisite for the generality of mankind; but time and experience will infallibly, sooner or later, familiarize his mind completely with his situation. A capacity for system and for philosophical arrangement, unless it has been carefully cultivated in early life, is an acquisition which can scarcely be made afterwards; and, therefore, the defects which I already mentioned, as connected with early and constant habits of business, adopted from imitation, and undirected by theory, may, when once these habits are confirmed, be pronounced to be incurable.

How to retain knowledge permanently. — I am also inclined to believe, both from a theoretical view of the subject, and from my own observations, as far as they have reached, that if we wish to fix the particulars of our knowledge very permanently in the Memory, the most effectual way of doing it, is to refer them to general principles. Ideas which are connected together merely by casual relations, present themselves with readiness to the mind, so long as we are forced by the habits of our situation to apply them daily to use; but when a change of circumstances lead us to vary the objects of our attention, we find our old ideas gradually to escape from the recollection; and if it should happen that they escape from it altogether, the only method of recovering them, is by renewing those studies by which they were at first acquired. The case is very different with a man whose ideas, presented to him at first by accident, have been afterwards philosophically arranged and referred to general principles. When he wishes to recollect them, some time and reflection will, frequently, be necessary to enable him to do so; but the information which he has once completely acquired, continues, in general, to be an acquisition for life; or if, accidentally, any article of it should be lost, it may often be recovered by a process of reasoning.

A language caught by the ear is generally spoken with more of the ease of a native than if it had been learned by rule; but, in the course of a few years, it is often as completely obliterated from the memory as if it had never been acquired. It is only by a complete possession of the principles of a language, that we can hope to make it an acquisition for life. We may see this daily illustrated, in the uncertain hold which girls commonly retain of the *French* acquired at boarding-schools, when compared with the permanent acquaintance with *Latin* which boys receive from a regular classical education. Few boys, however well educated, read and speak *Latin* with the same facility and fluency with which we daily see young ladies read and speak *French;* yet how seldom do they ever lose afterwards a competent knowledge of the Latin tongue!

A philosophical arrangement of our ideas is attended with another very important advantage. In a mind where the prevailing principles of association are founded on casual relations among the various objects of its knowledge, the thoughts must necessarily succeed each other in a very irregular and disorderly manner, and the occasions on which they present themselves will be determined merely by accident. They will often occur when they cannot be employed to any purpose, and will remain concealed from our view when the recollection of them might be useful. They cannot, therefore, be considered as under our own proper command. But in the case of a philosopher, how slow soever he may be in the recollection of his ideas, he knows always where he is to search for them, so as to bring them all to bear on their proper object. When he wishes to avail himself of his past experience, or of his former conclusions, the occasion itself summons up every thought in his mind which the occasion requires. Or if he is called upon to exert his powers of invention and of discovery, the materials of both are always at hand, and are presented to his view with such a degree of connection and arrangement as may enable him to trace with ease their various relations. How much invention depends upon a patient and attentive examination of our ideas in order to discover the less obvious relations which subsist among them, I had occasion to show at some length in a former chapter.*

Why philosophers do not excel in conversation. — The remarks which have been now made are sufficient to illustrate the advantages which the philosopher derives in the pursuits of science from that sort of systematical Memory which his habits of arrangement give him. It may, however, be doubted whether such habits be equally favorable to a talent for agreeable conversation, at least for that lively, varied conversation, which forms the principal charm of a promiscuous society. The conversation which pleases generally, must unite the recommendations of quickness, of ease, and of variety; and in all these three respects, that of the philosopher is apt to be deficient. It is deficient in quickness, because his ideas are connected by relations which occur only to an attentive and collected mind. It is deficient in ease, because these relations are not the casual and obvious ones by which ideas are associated in ordinary memories, but the slow discoveries of patient, and often painful, exertion. As the ideas, too, which he associates together, are commonly of the same class, or at least are referred to the same general principles, he is in danger of becoming tedious, by indulging himself in long and systematical discourses; while another, possessed of the most inferior accomplishments, by laying his mind completely open to impressions from without, and by accommodating continually the course of his own ideas, not only to the ideas which are stated by his companions, but to every trifling and unexpected accident that may occur to give them a new direction, is the life and soul of every society into which he enters. Even the anecdotes which the philosopher has collected, however agreeable they may be in themselves, are seldom introduced by him into conversation with that unstudied but happy propriety which we admire in men of the world, whose facts are not referred to general principles, but are suggested to their recollection by the familiar topics and occurrences of ordinary life. Nor is it the imputation of tediousness merely, to which the systematical thinker must submit from common observers. It is but rarely possible to explain completely, in a promiscuous society, all the various parts of the most simple theory; and, as nothing appears weaker or more absurd than a theory which is partially stated, it frequently happens that men of ingenuity, by attempting it, sink, in the vulgar apprehension, below the level of ordinary understandings. "Theoriarum vires," says Lord Bacon, "in apta et se mutuo sustinente partium harmonia et quadam in orbem demonstratione consistunt, ideoque per partes traditæ infirmæ sunt." [The excellence of theory lies in the fitness and harmony of the parts mutually sustaining each other; so that a theory, enunciated piecemeal, is comparatively weak.]

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* The practice which literary men in general have of committing to writing the knowledge they acquire, together with the ready access which all ranks have now to the use of books, has a tendency to weaken the faculty of memory, by superseding the necessity of its more extraordinary exertions. It was on this principle that the Druids (as we are informed by Cæsar in his Commentaries), although they knew the Greek letters, abstained from the use of writing in recording their theological and philosophical doctrines.

Peculiarities of casual Memory. — Before leaving the subject of casual Memory, it may not be improper to add, that how much soever it may disqualify for systematical speculation, there is a species of loose and rambling composition to which it is peculiarly favorable. With such performances it is often pleasant to unbend the mind in solitude, when we are more in the humor for conversation than for connected thinking. Montaigne is unquestionably at the head of this class of authors. "What, indeed, are his essays," to adopt his own account of them, "but grotesque pieces of patchwork, put together without any certain figure, or any order, connection, or proportion, but what is accidental?" (Liv. i. chap. 27.)

It is, however, curious, that in consequence of the predominance in his mind of this species of Memory above every other, he is forced to acknowledge his total want of that command over his ideas which can only be founded on habits of systematical arrangement. As the passage is extremely characteristical of the author, and affords a striking confirmation of some of the preceding observations, I shall give it in his own words. "Je ne me tiens pas bien en ma possession et disposition: le hazard y a plus de droit que moy: l'occasion, la compagnie, le branle même de ma voix tire plus de mon esprit, que je n'y trouve lorsque je sonde et employe à part moy. Ceci m'advient aussi, que je ne me trouve pas où je me cherche; et me trouve plus par rencontre, que par l'inquisition de mon jugement."*

The differences which I have now pointed out between philosophical and casual Memory, constitute the most remarkable of all the varieties which the minds of different individuals, considered in respect to this faculty, present to our observation. But there are other varieties of a less striking nature, the consideration of which may also suggest some useful reflections.

Sights remembered more easily than sounds.—It was before remarked, that our ideas are frequently associated in consequence of the associations which take place among their arbitrary signs. Indeed, in the case of all our general speculations, it is difficult to see in what other way our thoughts can be associated; for I before endeavored to show, that, without the use of signs of one kind or another, it would be impossible for us to make classes, or genera, objects of our attention.

All the signs by which our thoughts are expressed are addressed either to the eye or to the ear; and the impressions made on these organs at the time when we first receive an idea, contribute to give us a firmer hold of it. Visible objects (as I observed in the chapter on conception) are remembered more easily than those of any of our other senses; and hence it is, that the bulk of mankind are more aided in their recollection by the impressions made on the eye than by those on the ear. Every person must have remarked, in studying the elements of geometry, how much his recollection of the theorems was aided by the diagrams which are connected with them; and I have little doubt, that the difficulty which students commonly find to remember the propositions of the fifth book of Euclid, arises chiefly from this, that the magnitudes to which they relate, are represented by straight lines, which do not make so strong an impression on the memory, as the figures which illustrate the propositions in the other five books.

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* [Montaigne's language is so exquisitely idiomatic, that a literal version gives hardly a glimpse of his meaning. The following is a mere paraphrase of the passage in the text.

"I do not have full possession and command of my own mind; chance has more power over it than I have; occasion, company, even the sound of my own voice, draws more out of my understanding than I can, when I probe and try it in solitude. This also happens to me, that I cannot find my ideas where I look for them, but rather stumble upon them unawares."]

This advantage, which the objects of *sight* naturally have over those of *hearing*, in the distinctness and the permanence of the impressions which they make on the Memory, continues, and even increases, through life, in the case of the bulk of mankind; because their minds, being but little addicted to general and abstract disquisitions, are habitually occupied, either with the immediate perception of such objects, or with speculations in which the conception of them is more or less involved; which speculations, so far as they relate to individual things and individual events, may be carried on with little or no assistance from language.

The case is different with the philosopher, whose habits of abstraction and generalization lay him continually under a necessity of employing words as an instrument of thought. Such habits, coöperating with that inattention which he is apt to contract to things external, must have an obvious tendency to weaken the original powers of recollection and conception with respect to visible objects; and at the same time, to strengthen the power of retaining propositions and reasonings expressed in language. The common system of education, too, by exercising the Memory so much in the acquisition of grammar rules, and of passages from the ancient authors, contributes greatly, in the case of men of letters, to cultivate a capacity for retaining words.

How verbal Memory may be cultivated. — It is surprising of what a degree of culture our power of retaining a succession, even of insignificant sounds, is susceptible. Instances sometimes occur, of men who are easily able to commit to Memory a long poem, composed in a language of which they are wholly ignorant; and I have myself known more than one instance of an individual, who, after having forgotten completely the classical studies of his childhood, was yet able to repeat with fluency long passages from Homer and Virgil, without annexing an idea to the words that he uttered.

This susceptibility of Memory with respect to words, is possessed by all men in a very remarkable degree in their early years, and is, indeed, necessary to enable them to acquire the use of language; but unless it be carefully cultivated afterwards by constant exercise, it gradually decays as we advance to maturity. The plan of education which is followed in this country, however imperfect in many respects, falls in happily with this arrangement of nature, and stores the mind richly, even in infancy, with intellectual treasures, which are to remain with it through life. The rules of grammar, which comprehend systems, more or less perfect, of the principles of the dead languages, take a permanent hold of the Memory, when the understanding is yet unable to comprehend their import; and the classical remains of antiquity, which, at the time we acquire them, do little more than furnish a gratification to the ear, supply us with inexhaustible sources of the most refined enjoyment; and, as our various powers gradually unfold themselves, are poured forth, without effort, from the Memory, to delight the imagination, and to improve the heart. It cannot be doubted that a great variety of other articles of useful knowledge, particularly with respect to geographical and chronological details, might be communicated with advantage to children in the form of memorial lines. It is only in childhood that such details can be learned with facility; and if they were once acquired and rendered perfectly familiar to the mind, our riper years would be spared much of that painful and uninteresting labor, which is perpetually distracting our intellectual powers from those more important exertions for which, in their mature state, they seem to be destined.

This tendency of literary habits in general, and more particularly of philosophical pursuits, to exercise the thoughts about words, can scarcely fail to have some effect in weakening the powers of recollection and conception with respect to sensible objects; and, in fact, I believe it will be found, that whatever advantage the philosopher may possess over men of little education, in stating general propositions and general reasonings, he is commonly inferior to them in point of minuteness and accuracy, when he attempts to describe any object which he has seen, or any event which he has witnessed; supposing the curiosity of both, in such cases, to be interested in an equal degree. I acknowledge, indeed, that the undivided attention which men unaccustomed to reflection are able to give to the objects of their perceptions, is, in part, the cause of the liveliness and correctness of their conceptions.

Varieties of Memory in respect to technical or general description. — With this diversity in the intellectual habits of cultivated and of uncultivated minds, there is another variety of Memory which seems to have some connection. In recognizing visible objects, the Memory of one man proceeds on the general appearance; that of another attaches itself to some minute and distinguishing marks. A peasant knows the various kinds of trees from their general habits; a botanist, from those characteristical circumstances on which his classification proceeds. The last kind of Memory is, I think, most common among literary men, and arises from their habit of recollecting by means of words. It is evidently much easier to express by a description a number of botanical marks, than the general habit of a tree; and the same remark is applicable to other cases of a similar nature. But to whatever cause we ascribe it, there can be no doubt of the fact, that many individuals are to be found, and chiefly among men of letters, who, although they have no memory for the general appearances of objects, are yet able to retain with correctness an immense number of technical discriminations.

Each of these kinds of Memory has its peculiar advantages and inconveniences, which the dread of being tedious induces me to leave to the investigation of my readers.

Astonishing feats of Memory. — Among the extraordinary exertions of Memory recorded in history, it is worthy of observation, that many of them (more especially of those which are handed down to us from ancient times) relate to acquisitions of the most trifling nature; or at least, to acquisitions which, in the present age, would be understood to reflect but little credit on the capacity of those who should consider the possession of them as a subject of vanity. In judging, however, of such particulars, when they occur in the lives of eminent men, due allowances ought always to be made for the essential differences between the political institutions of the old world and those of modern Europe. Thus, when we are told of Themistocles, that he could call by their names all the citizens of Athens (whose number was 20,000); and of Cyrus, that he knew the name of every soldier in his army, it ought to be recollected, that contemptible as these acquisitions might now appear in men equally elevated by their rank, they were probably not altogether useless to the general of an ancient army, or to the chief of an ancient republic. The different state of manners prior to the invention of printing, and, in particular, the state of manners in ancient Greece and Rome, rendered the cultivation of Memory an object of far greater importance to those who were destined for public life, than it is under any of our modern governments; and, accordingly, extraordinary endowments of this sort form a far more prominent feature in the characters of their illustrious writers and statesmen than they do in modern biography. Examples of this must immediately crowd on the recollection of every person at all conversant with the classics.

The facts with respect to Memory, which I have chiefly in my eye at present, may be divided into two classes, according as they relate to occasional exertions of Memory on particular subjects, or to the general mass of acquired information treasured up in the mind. Of the first kind are the intellectual feats ascribed to Cineas, and to Hortensius. The former (we are told) when he came to Rome as ambassador from King Pyrrhus, saluted, on the day after his arrival, all the senators and persons of the equestrian order by their names; the latter, after sitting a whole day at a public sale, gave an account from Memory in the evening of all the things sold, with the prices and the names of the purchasers; which account was found on examination to agree in every particular with what had been taken in writing by a notary. Nor will these anecdotes appear incredible, when compared with what Muretus himself *saw* at Padua, of a young Corsican, who, without stop or hesitation, recited thirty-six thousand names in the same order in which he had heard them, and afterwards, beginning at the last, proceeded, in a contrary order, to the first.

To the same class of facts belong (although they indicate also the strength of still higher faculties) those efforts which some individuals are able to make, by mere force of attention and Memory, in the way of arithmetical computation. We are told by the celebrated Dr. Wallis of Oxford, that "he himself could, in the dark, perform arithmetical operations, as multiplication, division, and extraction of roots, *to forty decimal places*, particularly, that, in February, 1671, he proposed to himself, by night in bed, (at the request of a foreigner,) a number of fifty-three places, and found its square root to twenty-seven places, and that, without ever writing down the number, he dictated the result from memory twenty days afterwards." None of the facts, with respect to memory, which I have met with in ancient authors, conveys to me so high an idea of the wonders which may be effected by a patient and steady concentration of our mental powers.

Great Memories of philosophers.—These facts, however, which relate to *occasional exertions of Memory on particular subjects*, do not lead to conclusions of so great practical utility, nor are they, perhaps, when duly weighed, so astonishing in themselves, as those which illustrate the *comprehensiveness and retentiveness* of which this faculty has been sometimes found susceptible, with respect to the *general stock* of human knowledge. A memorable, or rather an extreme, case of this sort is said to have occurred in "that prodigy of parts, Mr. Pascal," of whom Mr. Locke tells us, "*it was reported*, that, till the decay of his health had impaired his mind, he forgot nothing of what he had done, read, or thought, in any part of his rational age." A statement to which, (making every allowance for the usual exaggerations of testimony,) I do not know that any thing exactly parallel can be produced in the history of any other individual equally distinguished by all the highest gifts of the understanding.

The learned Menage, whom Bayle calls the Varro of the seventeenth century, deserves also to be mentioned here, on account of the extraordinary strength and extent of his memory; but still more, on account of the singular degree in which he appears to have *recovered* that faculty, after it had been greatly impaired and almost destroyed by the infirmities of old age. Few physiological facts, relating to the mind, are so well attested as this, Menage having himself commemorated his own very interesting history in Latin verses not inferior to any of his juvenile productions; and, making due abatements for some slight poetical licenses, the circumstances which he records cannot have differed widely from the truth.

Another instance of the same sort of memory, though in a very inferior man, occurred in France, about a hundred years ago, in the Abbé de Longuerue, whose erudition (to borrow an expression which D'Alembert applies to it) was not only prodigious, but *terrible*. His extraordinary powers displayed themselves even in his childhood, to such a degree, that Louis XIV., when passing through Charleville, stopped to see him as a curiosity. Greek and even Hebrew (we are told) were as familiar to him as his native tongue; and on questions of literature, Paris consulted him as an oracle. His mind was so well furnished, not only with historical facts, but with the minutiæ of chronology and topography, that, upon hearing a person remark in conversation, that it would be a difficult task to write a good historical description of France, he asserted that he could do it from Memory, without consulting any books. All he asked was to have some good *maps of France* laid before him.* These recalled to him the history of each province, of all the fiefs of the crown of each city, and even of each distinguished nobleman's seat in the kingdom. He wrote his folio History in a year, which, notwithstanding some very gross errors, is allowed to be correct, not only in its general outlines, but in by far the greater part of its trifling details.

Education to be conformed to the peculiarities of Memory. — With respect to this extraordinary person, Miss Edgeworth quotes from the Marquis d'Argenson an anecdote, of which some use may, I think, be made by those who are employed in the education of children. When the Marquis asked him how he managed to arrange and retain in his head every thing that entered it, he answered, by observing in general terms, "That the elements of every science must be learned whilst we are very young; not only the first principles of *every language*, but *the A, B, C, of every kind of knowledge.* This," he adds, "is not difficult in youth, especially as it is not necessary to penetrate far. Simple notions are sufficient; when these are once acquired, every thing we read afterwards finds its proper place."

This remark appears to me to be equally just and important; and I am disposed to lay the greater stress upon it, as, in the person to whom it is ascribed, it must be considered merely as an experimental result drawn from the history of his own mind, and not as an inference from any theoretical principles concerning the nature and laws of Memory. It contains, I suspect, a great secret of that species of education which is commonly given to people of very high rank; to whom a power of plausible and imposing discourse is too frequently conceived to be an object of greater value than the possession of just and enlightened opinions. In the education, however, of all without exception, it is susceptible, under proper management, of the most important practical application, not only in facilitating the future acquisition of *ornamental knowledge*, but in laying an early foundation for that most valuable sort of Memory which spontaneously and insensibly *classifies*, (or, as the Abbé de Longuerue expressed it, *puts in its proper place*,) every particular fact at the moment when it is first presented to the mind. This plan, indeed, seems manifestly to be pointed out to us by nature herself, inasmuch as she has rendered the impressions of early youth incomparably more permanent than those of our more advanced years; and by doing so, has furnished the means to a skilful instructor, of extending the advantage of that precious season over the whole of life.

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* This circumstance deserves attention, as it shows what reliance he placed on *visible objects* and *local associations*, as adminicles to his powers of recollection. He availed himself, in fact, of the same general principle which suggested the topical Memory of the ancient rhetoricians; and of which the efficacy is abundantly confirmed by our own daily experience. Whoever has paid any attention to the education of young persons, must be satisfied that the only effectual expedient for fixing historical knowledge in their minds, is to unite the studies of history and of geography together, by accustoming them to refer every occurrence to the spot where it took place, and to follow with the eye, upon an accurate map, every change of scene in the narrative. The greater part of artificial devices, which have been thought of for the same purpose, are mere trick and quackery. They may, perhaps, be occasionally subservient to an ostentatious display, but, on the whole, they can scarcely fail to do more harm than good to the understanding.

Memory as a measure of intellectual capacity in general.—From these details, (and it would be very easy to add to their number,) it sufficiently appears, that extraordinary powers of Memory do not always indicate a corresponding measure of *intellectual capacity in general*. At the same time, I can by no means subscribe to the prevailing opinion, that extraordinary powers of Memory are incompatible either with judgment or with genius. On the contrary, I can scarcely recollect (as I have elsewhere observed) any one person very eminently distinguished by the latter qualities, who has not also possessed a more than common share of the former. And, indeed, if we only consider for a moment how intimately this faculty is connected with every species of mental improvement, it must appear perfectly manifest, that, however numerous the instances may be in which great powers of Memory are united with a deficiency in other intellectual endowments, it is nevertheless an unquestionable truth, that a vigorous and retentive Memory may be fairly ranked among the most important of the qualities which enter into the composition either of an inventive genius, or of a comprehensive understanding. In the case, too, of some individuals of the most powerful and splendid talents, the same preternatural strength of Memory has been exemplified, which, in most instances, is considered, and, perhaps, not altogether without reason, as symptomatical of a weak and superficial judgment. Of this I have already produced some remarkable proofs in the course of the foregoing observations.

Why Memory is not so much cultivated among the moderns. — It is justly observed by Miss Edgeworth, that such prodigies of Memory are not *now* to be looked for, as we have reason to believe were not uncommon in Europe a very few centuries ago. "The art of printing, by multiplying copies of books, so as to put them within the reach of all classes of the people, has *lowered the value* of those extraordinary powers which some of the learned were then accustomed to display with so much ostentation. At the revival of literature in Europe, a man who had read a few manuscripts, and could repeat them, was not merely a *wonder*, but a *treasure;* he could travel from place to place, and live by his learning; and had far more encouragement to engrave the words of others on his memory, than to exercise his own powers of judgment and invention." In later times the case is greatly altered. A reference in a commonplace-book to a particular page, relieves the Memory entirely of its burden; a good index supersedes the labor of years; or (as Pope has very happily expressed the same idea,)

> "Though index-learning turns no student pale,
> It holds the eel of science by the tail."

Original differences among men in respect to Memory. — The facts which have been already mentioned sufficiently account for the common opinion, that the original differences among men in their capacities of Memory, are incomparably greater than in the case of any other faculty. Nay, I must confess, they seem to show that this opinion is not altogether without foundation.

At the same time, I am fully satisfied that these differences are greatly overrated. Even in those cases where Memory seems to be the weakest and most incapable of culture, there is commonly sufficient capacity to enable the individual to acquire a competent knowledge of his mother-tongue, and to learn to recognize, at the first glance, an immense multitude of particular objects belonging to all the different departments of nature; beside that general acquaintance with the laws of the material world, and the properties of material substances, which is necessary for the preservation of our animal existence; and that no less indispensable acquaintance with many maxims of common sense, relative to life and conduct, without a knowledge of which a man approaches to the condition of an idiot or changeling. If we were to analyze carefully this stock of information, it would be found to comprehend a far greater number of particulars than we might be disposed at first to suspect.

I shall avail myself of the title which I have prefixed to this section, to introduce here a few detached passages from different authors, which appear to me worthy of the attention of those who take an interest in the study of the mind. Some of them are from books not likely to excite the curiosity of the generality of readers; and all of them may be more or less useful in illustrating the foregoing conclusions. With these extracts I shall intersperse slight comments of my own.

Philosophical minds incapable of attending to trifling details. — I begin with a passage from Leibnitz, one of the few philosophers who have favored the world with any reflections on the peculiarities of his own intellectual character. [" Invention or ingenuity, like Memory, is of two kinds; the one prompt, being a quality of genius, the other sure, depending on good judgment. Eloquent persons possess the former, men who are slow in forming their conclusions, but yet are not ill-adapted for business, have the latter. Others form a remarkable variety, as in certain times and places, they are wonderfully prompt, and on other occasions, extremely slow. Among these last I rank myself, and also perceive that there are few who have the same peculiarity, that *all easy things are difficult to me, and on the other hand, all difficult things are easy.*"]

Upon this very remarkable expression with respect to himself, it were to be wished that Leibnitz had enlarged a little more fully. The only interpretation I can put upon it is, that he felt a certain degree of *difficulty* necessary to rouse his intellectual faculties to action; and that, in consequence of this circumstance, (combined probably with a consciousness of his own powers,) he was inferior to the common run of mankind in some of those easy acquisitions which are within the reach of all. The case, I apprehend, is not a singular one; as we often meet with men of the most splendid talents, who are deficient, to a ludicrous degree, in some of the most simple and mechanical branches of school education. I shall only mention, as examples, the art of penmanship, and the still more important one, of arithmetical computation; in both of which, (though from different causes,) the progress of the student is retarded rather than aided by an extraordinary degree of quickness and of intellectual capacity; and in which, accordingly, men of genius may be expected to fall below the general standard, unless in those cases where they have had the good fortune to be carefully trained to the practice of them in their childhood, or very early youth. All such acquisitions (it may be here observed by the way,) should, on this account, be rendered by habit a second nature, before the powers of reason and reflection have attained such a degree of strength as to render the task of the learner irksome to himself, by presenting more interesting objects to his curiosity. The art of reading, in particular, may be taught to infants by any person of common sense, by a process almost as insensible as the use of speech.

The foregoing quotation from Leibnitz brings to my recollection a fragment of Montesquieu, which affords a memorable proof of the difficulty which men of superior minds frequently experience in acquiring a ready and practical knowledge of those trifling and uninteresting details, which are treasured up without any effort by those to whose understandings they are more congenial. "With respect to my employment as president, [a judicial title in France,] I have an upright heart — I comprehend with ease the nature of the business; but of the forms of the court I understand nothing, though I took pains to acquire that knowledge; and what dispirits me most at it is, that I observe in some blockheads the very talent I seem unable to attain."

I should, perhaps, have taken an earlier opportunity of remarking, that in contrasting, as I have occasionally done in this section, the *species* of Memory possessed by philosophers with that possessed by the vulgar and illiterate, I evidently have in view those effects only which their respective pursuits *have a tendency* to produce on the intellectual character. Many exceptions to our general conclusions may be expected in particular instances; nor does there seem to be any impossibility in the nature of things to unite, by a proper education, the advantages of *both* kinds of Memory. That incapacity, for example, of attending to trifling details, of which Montesquieu complains in the above quotation, and which is one great source of what is generally called a *bad Memory*, is undoubtedly a most serious inconvenience to all who have to mingle in the business of the world; and although it is justly overlooked in those whose talents and acquirements raise them much above the common level, yet it can scarcely be guarded against enough by all those who have any concern in the education of youth. To enable a person to command his attention, at all times, to whatever object is before him, whether trifling or important, so that "whatsoever his hand findeth to do, he may do it with all his might," is one of the most important habits that can be communicated to his mind. And it would form a most valuable article in a systematical treatise on education, to point out the means by which this habit may be cultivated, or the contrary habits of inattention corrected where they have unfortunately been contracted.

The following judicious remark of Mr. Knox, (in his Treatise on Education,) while it throws some additional light on these *varieties* of Memory which have been now under our consideration, suggests a practical lesson which cannot be too steadily kept in view by all who devote themselves to the study of literature and of the sciences. In point of value, it seems to me to rise considerably above the ordinary level of this author's philosophy.

"Some persons seem to think that a good Memory consists in retaining dates and minute particulars, but I believe, that, though a reader remember but few dates and few minute particulars, he may yet retain all the necessary *general ideas and valuable conclusions.* He will see a wide and beautiful arrangement of important objects, while another, who stoops to pick up and preserve every trifle, will have his eyes fixed on the ground. It is not enough that the mind can *reproduce* just what it has received from reading, and no more; it must reproduce it *digested, altered, improved, and refined.* Reading, like food, must show its effects in promoting growth; according to a striking remark of Epictetus, the application of which is sufficiently obvious without any comment; 'Sheep do not show the shepherd how much they have eaten by producing *the grass itself;* but by producing outwardly *wool and milk* after their pasture is inwardly digested.'"

III. *Of the improvement of Memory.* — *Analysis of the principles on which the culture of Memory depends.* — The improvement of which the mind is susceptible by culture, is more remarkable, perhaps, in the case of Memory, than in that of any other of our faculties. The fact has been often taken notice of in general terms; but I am doubtful if the particular mode in which culture operates on this part of our constitution, has been yet examined by philosophers with the attention which it deserves.

Of one sort of culture, indeed, of which Memory is susceptible in a very striking degree, no explanation can be given; I mean the improvement which the original faculty acquires by mere *exercise;* or, in other words, the tendency which practice has to increase our natural facility of association. This effect of practice upon the Memory, seems to be an ultimate law of our nature; or rather, to be a particular instance of that general law, that all our powers, both of body and mind, may be strengthened, by applying them to their proper purposes.

Besides, however, the improvement which Memory admits of, in consequence of the effects of exercise on the original faculty, it may be greatly aided in its operations, by *those expedients* which reason and experience suggest for employing it to the best advantage. These expedients furnish a curious subject of philosophical examination; perhaps, too, the inquiry may not be altogether without use; for, although our principal resources for assisting the Memory be suggested by nature, yet it is reasonable to think, that in this, as in similar cases, by following out systematically the hints which she suggests to us, a further preparation may be made for our intellectual improvement.

How Memory becomes more susceptible and retentive. — Every person must have remarked, in entering upon any new species of study, the difficulty of treasuring up in the Memory its elementary principles; and the growing facility which he acquires in this respect, as his knowledge becomes more extensive. By analyzing the different causes which concur in producing this facility, we may, perhaps, be led to some conclusions which may admit of a practical application.

1. In every science, the ideas about which it is peculiarly conversant, are connected together by some particular associating principle; in one science, for example, by associations founded on the relation of cause and effect; in another, by associations founded on the necessary relations of mathematical truths; in a third, on associations founded on contiguity in place or time. Hence one cause of the gradual improvement of Memory with respect to the familiar objects of our knowledge; for whatever be the prevailing associating principle among the ideas about which we are habitually occupied, it must necessarily acquire additional strength from *our favorite study.*

2. In proportion as a science becomes more *familiar* to us, we acquire a greater command of attention with respect to the objects about which it is conversant; for the information which we already possess, gives us an interest in every new truth and every new fact which have any relation to it. In most cases,

our habits of inattention may be traced to a want of curiosity; and therefore such habits are to be corrected, not by endeavoring to force the attention in particular instances, but by gradually learning to place the ideas which we wish to remember, in an interesting point of view.

3. When we first enter on any new literary pursuit, we are unable to make a proper discrimination in point of utility and importance, among the ideas which are presented to us; and by attempting to grasp at every thing, we fail in making those moderate acquisitions which are suited to the limited powers of the human mind. As our information extends, our selection becomes more judicious and more confined; and our knowledge of useful and connected truths advances rapidly, from *our ceasing to distract the attention* with such as are detached and insignificant.

4. Every object of our knowledge is related to a variety of others; and may be presented to the thoughts, sometimes by one principle of association, and sometimes by another. In proportion, therefore, to the multiplication of *mutual relations* among our ideas, (which is the natural result of growing information, and in particular, of habits of philosophical study,) the greater will be the number of occasions on which they will recur to the recollection, and the firmer will be the root which each idea, in particular, will take in the Memory.

It follows, too, from this observation, that the facility of retaining a new fact, or a new idea, will depend on *the number of relations which it bears to the former objects of our knowledge;* and, on the other hand, that every such acquisition, so far from loading the Memory, gives us a firmer hold of all that part of our previous information, with which it is in any degree connected.

It may not, perhaps, be improper to take this opportunity of observing, although the remark be not immediately connected with our present subject, that the accession made to the stock of our knowledge, by the new facts and ideas which we acquire, is not to be estimated merely by the number of these facts and ideas considered individually; but by the number of relations which they bear to one another, and to all the different particulars which were previously in the mind; for "new knowledge," as Mr. Maclaurin has well remarked, "does not consist so much in our having access to a new object, as in comparing it with others already known, observing its relations to them, or discerning what it has in common with them, and wherein their disparity consists; and, therefore, our knowledge is vastly greater than the sum of what all its objects separately could afford; and when a new object comes within our reach, the addition to our knowledge is the greater, the more we already know; so that it increases, not as the new objects increase, but in a much higher proportion."

The above passage may serve to illustrate an ingenious and profound remark of Duclos, in his *Considerations sur les Mœurs*. "If education was judiciously conducted, the mind would acquire a great stock of truths with greater ease than it acquires a small number of errors. Truths have among themselves a relation and connection, certain points of contact, which are equally favorable to the powers of apprehension and of Memory; while, on the other hand, errors are commonly so many insulated propositions, of which, though it be difficult to shake off the authority, it is easy to prevent the original acquisition."

5. In the last place, the natural powers of Memory are, in the case of the philosopher, greatly aided by his peculiar habits of *classification and arrangement.* As this is by far the most important improvement of which Memory is susceptible, I shall consider it more particularly than any of the others I have mentioned.

How Memory is aided by the classification of ideas. — The advantages which the Memory derives from a proper classification of our ideas, may be best conceived by attending to its effects in enabling us to conduct with ease the common business of life. In what inextricable confusion would the lawyer or the merchant be immediately involved, if he were to deposit, in his cabinet, promiscuously, the various written documents which daily and hourly pass through his hands? Nor could this confusion be prevented by the natural powers of Memory, however vigorous they might happen to be. By a proper distribution of these documents, and a judicious reference of them to a few general titles, a very ordinary Memory is enabled to accomplish more, than the most retentive, unassisted by method. We know, with certainty, where to find any article we may have occasion for, if it be in our possession; and the search is confined within reasonable limits, instead of being allowed to wander at random amidst a chaos of particulars.

Or, to take an instance still more immediately applicable to our purpose; suppose that a man of letters were to record, in a commonplace-book, without any method, all the various ideas and facts which occurred to him in the course of his studies; what difficulties would he perpetually experience in applying his acquisitions to use? and how completely and easily might these difficulties be obviated by referring the particulars of his information to certain general heads? It is obvious, too, that, by doing so, he would not only have his knowledge much more completely under his command, but as the particulars classed together would all have some connection, more or less, with each other, he would be enabled to trace, with advantage, those mutual relations among his ideas, which it is the object of philosophy to ascertain.

A commonplace-book, conducted without any method, is an exact picture of the Memory of a man whose inquiries are not directed by philosophy. And the advantages of order in treasuring up our ideas in the mind, are perfectly analogous to its effects when they are recorded in writing.

Nor is this all. In order to retain our knowledge distinctly and permanently, it is necessary that we should frequently recall it to our recollection. But how can this be done without the aid of arrangement? Or supposing that it were possible, how much time and labor would be necessary for bringing under our review the various particulars of which our information is composed? In proportion as it is properly systematized, this time and labor are abridged. The mind dwells habitually, not on detached facts, but on a comparatively small number of general principles; and, by means of these, it can summon up, as occasions may require, an infinite number of particulars associated with them; each of which, considered as a solitary truth, would have been as burdensome to the Memory, as the general principle with which it is connected.*

Classification alone does not constitute philosophy. — I would not wish it to be understood from these observations, that philosophy consists in classification alone; and that its only use is to assist the Memory. I have often, indeed, heard this asserted in general terms; but it rather appears to me to be obvious, that, although this be one of its most important uses, yet something more is necessary to complete the definition of it. Were the case otherwise, it would follow, that all classifications are equally philosophical, provided they are equally comprehensive. The very great importance of this subject will, I hope, be a sufficient apology for me, in taking this opportunity to correct some mistaken opinions which have been formed concerning it.

IV. *Aid which the Memory derives from philosophical arrangement.* — It was before observed, that the great use of the faculty of Memory, is to enable us to treasure up, for the future regulation of our conduct, the results of our past experience, and of our past reflections. But in every case in which we judge of the future from the past, we must proceed on the belief, that there is, in the course of events, a certain degree, at least, of uniformity. And, accordingly, this belief is not only justified by experience, but (as Dr. Reid has shown, in a very satisfactory manner,) it forms a part of the original constitution of the human mind. In the general laws of the material world, this uniformity is found to be complete; insomuch that, in the same combinations of circumstances, we expect, with the most perfect assurance, that the same results will take place. In the moral world, the course of events does not appear to be equally regular; but still it is regular to so great a degree, as to afford us many rules of importance in the conduct of life.

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* It is very justly and ingeniously remarked by Dr. Priestley, that "the more we know of any branch of science, the less is the compass into which we are able to bring its principles, provided the facts from which they are inferred be numerous." The reason is, that, "in an advanced state of knowledge, we are able to reduce more of the *particular* into *general* observations; whereas, in the infancy of a science, every observation is an independent fact; and, in delivering the principles of it, they must all be distinctly mentioned; so that, though a *selection* may be made, a proper abridgment is impossible."

A knowledge of nature, in so far as it is absolutely necessary for the preservation of our animal existence, is obtruded on us, without any reflection on our part, from our earliest infancy. It is thus that children learn of themselves to accommodate their conduct to the established laws of the material world. In doing so, they are guided merely by Memory, and the instinctive principle of anticipation which has just been mentioned.

In forming conclusions concerning future events, the philosopher, as well as the infant, can only build with safety on past experience; and he, too, as well as the infant, proceeds on an instinctive belief, for which he is unable to account, of the uniformity of the laws of nature. There are, however, *two important respects*, which distinguish the knowledge he possesses from that of ordinary men. In the *first* place, it is far *more extensive*, in consequence of the assistance which science gives to his natural powers of invention and discovery. *Secondly*, it is not only more easily retained in the Memory, and more conveniently applied to use, in consequence of the manner in which his ideas are arranged; but it enables him *to ascertain, by a process of reasoning, all those truths which may be synthetically deduced from his general principles.* The illustration of these particulars will lead to some useful remarks; and will at the same time show, that, in discussing the subject of this section, I have not lost sight of the inquiry which occasioned it.

How philosophy aids our powers of invention and discovery. — I. (1.) It was already remarked, that the natural powers of Memory, together with that instinctive anticipation of the future from the past, which forms one of the original principles of the mind, are sufficient to enable infants, after a very short experience, to preserve their animal existence. The laws of nature, which it is not so important for us to know, and which are the objects of philosophical curiosity, are not so obviously exposed to our view, but are, in general, brought to light by means of experiments which are made for the purpose of discovery; or, in other words, by artificial combinations of circumstances, which we have no opportunity of seeing conjoined in the course of our ordinary experience. In this manner, it is evident, that many connections may be ascertained, which would never have occurred spontaneously to our observation.

(2.) There are, too, some instances, particularly in the case of the astronomical phenomena, in which events, that appear to common observers to be altogether anomalous, are found, upon a more accurate and continued examination of them, to be subjected to a regular law. Such are those phenomena in the heavens, which we are able to predict by means of cycles. In the cases formerly described, our knowledge of nature is extended by placing her in new situations. In these cases, it is extended by continuing our observations beyond the limits of ordinary curiosity.

(3.) In the case of human affairs, as long as we confine our attention to particulars, we do not observe the same uniformity, as in the phenomena of the material world. When, however, we extend our views to events which depend on a combination of different circumstances, such a degree of uniformity appears, as enables us to establish general rules, from which probable conjectures may often be formed with respect to futurity. It is thus, that we can pronounce, with much greater confidence, concerning the proportion of deaths which shall happen in a certain period among a given number of men, than we can predict the death of any individual; and that it is more reasonable to employ our sagacity, in speculating concerning the probable determinations of a numerous society, than concerning events which depend on the will of a single person.

In what manner this uniformity in events depending on contingent circumstances is produced, I shall not inquire at present. The advantages which we derive from it are obvious, as it enables us to collect, from our past experience, many general rules, both with respect to the history of political societies, and the characters and conduct of men in private life.

(4.) In the last place, the knowledge of the philosopher is more extensive than that of other men, in consequence of the attention which he gives, not merely to objects and events, but to the *relations* which different objects and different events bear to each other.

The observations and the experience of the vulgar are almost wholly limited to things perceived by the senses. A similarity between different objects, or between different events, rouses their curiosity, and leads them to classification and to general rules. But a similarity between different *relations* is seldom to be traced without previous habits of philosophical inquiry. Many such similarities or connections, however, are to be found in nature; and when once they are ascertained, they frequently lead to important discoveries; not only with respect to other relations, but with respect to the objects or to the events which are related. These remarks it will be necessary to illustrate more particularly.

Aid derived from a study of the relations of things. — The great object of geometry is to ascertain the relations which exist between different quantities, and the connections which exist between different relations. When we demonstrate, that the angle at the centre of a circle is double of the angle at the circumference on the same base, we ascertain a relation between two quantities. When we demonstrate, that triangles of the same altitude are to each other as their bases, we ascertain a connection between two relations. It is obvious, how much the mathematical sciences must contribute to enlarge our knowledge of the universe, in consequence of such discoveries. In that simplest of all processes of practical geometry, which teaches us to measure the height of an accessible tower, by comparing the length of its shadow with that of a staff fixed vertically in the ground, we proceed on the principle, that the relation between the shadow of the staff and the height of the staff is the same with the relation between the shadow of the tower and the height of the tower. But the former relation we can ascertain by actual measurement; and, of consequence, we not only obtain the other relation, but, as we can measure one of the related quantities, we obtain also the other quantity. In every case in which mathematics assists us in measuring the magnitudes or the distances of objects, it proceeds on the same principle; that is, it begins with ascertaining connections among different relations, and thus enables us to carry our inquiries from facts which are exposed to the examination of our senses, to the most remote parts of the universe.

I observed, also, that there are various relations existing among physical events, and various connections existing among these relations. It is owing to this circumstance, that mathematics is so useful an instrument in the hands of the physical inquirer. In that beautiful theorem of Huygens, which demonstrates, that the time of a complete oscillation of a pendulum in the cycloid, is to the time in which a body would fall through the axis of the cycloid, as the circumference of a circle is to its diameter, we are made acquainted with a very curious and unexpected connection between two relations; and the knowledge of this connection facilitates the determination of a most important fact, with respect to the descent of heavy bodies near the earth's surface, which could not be ascertained conveniently by a direct experiment.

In examining with attention the relations among different physical events, and the connections among different relations, we sometimes are led by mere induction to the discovery of a general law, while, to ordinary observers, nothing appears but irregularity. From the writings of the earlier opticians we learn, that, in examining the first principles of dioptrics, they were led, by the analogy of the law of reflection, to search for the relation between the angles of incidence and refraction, (in the case of light passing from one medium into another,) in the angles themselves; and that some of them, finding this inquiry unsuccessful, took the trouble to determine, by experiments, (in the case of the media which most frequently fall under consideration,) the angle of refraction corresponding to every minute of incidence. Some very laborious tables, deduced from such experiments, are to be found in the works of Kircher. At length, Snellius discovered what is now called the law of refraction, which comprehends their whole contents in a single sentence: [the sine of the angle of incidence bears a constant ratio to the sine of the angle of refraction, for each refracting medium.]

The law of the planetary motions, deduced by Kepler, from the observations of Tycho Brahe, is another striking illustration of the order, which an attentive inquirer is sometimes able to trace, among the relations of physical events, when the events themselves appear, on a superficial view, to be perfectly anomalous.

Such laws are, in some respects, analogous to the cycles which I have already mentioned; but they differ from them in this, that a cycle is, commonly, deduced from observations made on physical events which are obvious to the senses; whereas the laws we have now been considering are deduced from an examination of relations which are known only to men of science. The most celebrated astronomical cycles, accordingly, are of a very remote antiquity, and were probably discovered at a period when the study of astronomy consisted merely in accumulating and recording the more striking appearances of the heavens.

II. *Memory aided by the power of deducing particular truths from general principles.* — Having now endeavored to show how much philosophy contributes to extend our knowledge of facts, by aiding our natural powers of invention and discovery, I proceed to explain in what manner it supersedes the necessity of studying particular truths, by putting us in possession of a comparatively small number of general principles in which they are involved.

I already remarked the assistance which philosophy gives to the Memory, in consequence of the arrangement it introduces among our ideas. In this respect, *even a hypothetical theory may facilitate the recollection of facts*, in the same manner in which the Memory is aided in remembering the objects of natural history by artificial classifications.*

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* [" Classification is a contrivance for the best possible ordering of the ideas of objects in our minds; for causing the ideas to accompany or suc-

The advantages, however, we derive from true philosophy, are incomparably greater than what are to be expected from any hypothetical theories. These, indeed, may assist us in recollecting the particulars we are already acquainted with; but it is only from the laws of nature, which have been traced analytically from facts, that we can venture, with safety, to deduce consequences by reasoning *à priori*. An example will illustrate and confirm this observation.

Suppose that a glass tube, thirty inches long, is filled with

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ceed one another in such a way as shall give us the greatest command over our knowledge already acquired, and lead most directly to the acquisition of more. The general problem of Classification, in reference to these purposes, may be stated as follows: To provide that things shall be thought of in such groups, and those groups in such an order, as will best conduce to the remembrance and to the ascertainment of their laws."

"There is no property of objects which may not be taken, if we please, as the foundation for a classification or mental grouping of those objects; and, in our first attempts, we are likely to select for that purpose properties which are simple, easily conceived, and perceptible on a first view, without any previous process of thought. Thus, Tournefort's arrangement of plants was founded on the shape and divisions of the corolla; and that which is commonly called the Linnæan, (though Linnæus also suggested another and more scientific arrangement,) was grounded chiefly upon the number of the stamens and pistils.

"But these classifications, which are at first recommended by the facility they afford us of ascertaining to what class any individual belongs, are seldom much adapted to the ends of that Classification which is the subject of our present remarks. [They are like the alphabetical arrangement of words in a dictionary, which answers no other purpose than that of enabling us easily to find the particular word which we are in search of.] The Linnæan arrangement answers the purpose of making us think together of all those kinds of plants which possess the same number of stamens and pistils; but to think of them in that manner is of little use, since we seldom have any thing to affirm in common of the plants which have a given number of stamens and pistils. . . . And inasmuch as, by habitually thinking of plants in these groups, we are prevented from habitually thinking of them in groups which have a greater number of properties in common, the effect of such a classification, when systematically adhered to, upon our habits of thought, must be regarded as mischievous.

"The ends of scientific classification are best answered when the objects mercury, excepting eight inches, and is inverted, as in the Torricellian experiment, so that the eight inches of common air may rise to the top; and that I wish to know at what height the mercury will remain suspended in the tube, the barometer being at that time twenty-eight inches high. There is here a combination of different laws, which it is necessary to attend to, in order to be able to predict the result. 1. The air is a heavy fluid, and the pressure of the atmosphere is measured by the column of mercury in the barometer. 2. The air is an elastic fluid, and its elasticity at the earth's surface (as it resists the pressure of the atmosphere) is measured by the column of mer-

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are formed into groups, respecting which a greater number of general propositions can be made, and those propositions more important, than could be made respecting any other groups into which the same things could be distributed. The properties, therefore, according to which objects are classified, should, if possible, be those which are the causes of many other properties; or, at any rate, which are sure marks of them. . . . A classification thus formed is properly scientific or philosophical, and is commonly called a Natural, in contradistinction to a Technical or Artificial, classification or arrangement." Mill's *System of Logic*, Am. ed. pp. 432–434.

To these excellent remarks of Mr. Mill, it may be added, that writers even upon the moral sciences, in which classification is less essential as an aid to the processes of invention and discovery, still strive to assist the Memory of their readers, and to give a sort of factitious unity to their otherwise isolated disquisitions, by bringing forward, with undue prominence, some one fact or principle, on which all their other speculations seem to hitch, and which serves, so to speak, as a kind of key-note to the whole work. Thus, in his *Theory of Moral Sentiments*, Adam Smith, as we believe, places more stress upon *sympathy*, and adduces it more frequently to aid in the explanation of complex moral phenomena, than he would have done for purely philosophical reasons, had he not wished to give a semblance of harmony and systematic completeness to his remarks upon a great variety of subjects. He uses a similar artifice in his great work upon the *Wealth of Nations*, in which a great deal more is said about the *division of labor*, than would have appeared necessary, had he not been anxious to avoid the air of desultory speculation. A more transparent artifice is often adopted by periodical essayists, like Steele, Swift, Addison, and Goldsmith, by carrying out the fiction of a club of contributors, or an imaginary editor, so that rambling essays upon many subjects may have a slender thread of connection with each other.]

cury in the barometer. 3. In different states, the elastic force of the air is reciprocally as the spaces which it occupies. But, in this experiment, the mercury which remains suspended in the tube, together with the elastic force of the air in the top of the tube, is a counterbalance to the pressure of the atmosphere; and therefore, their joint effect must be equal to the pressure of a column of mercury twenty-eight inches high. Hence we obtain an algebraical equation, which affords an easy solution of the problem. It is further evident, that my knowledge of the physical laws which are here combined, puts it in my power to foretell the result, *not only in this case, but in all the cases of a similar nature* which can be supposed. The problem, in any particular instance, might be solved by making the experiment; but the result would be of no use to me, if the slightest alteration were made on the data.

It is in this manner that philosophy, by putting us in possession of a few general facts, enables us to determine, by reasoning, what will be the result of any supposed combination of them, and thus to comprehend an infinite variety of particulars, which no Memory, however vigorous, would have been able to retain. In consequence of the knowledge of such general facts, the philosopher is relieved from the necessity of treasuring up in his mind all those truths which are involved in his principles, and which may be deduced from them by reasoning; and he can often prosecute his discoveries, synthetically, in those parts of the universe which he has no access to examine by immediate observation. There is, therefore, this important difference between the *hypothetical theory* and a *theory obtained by induction;* that the latter not only enables us to remember the facts we already know, but to ascertain, by reasoning, many facts which we have never had an opportunity of examining: whereas, when we reason from a hypothesis *à priori*, we are almost certain of running into error; and, consequently, whatever may be its use to the Memory, it can never be trusted to in judging of cases which have not previously fallen within our experience.

In what sciences hypothetical theories are most useful. — There are some sciences, in which hypothetical theories are more useful than in others; those sciences, to wit, in which we have occasion for an extensive knowledge and a ready recollection of facts, and which, at the same time, are yet in too imperfect a state to allow us to obtain just theories by the method of induction. This is particularly the case in the science of *medicine*, in which we are under a necessity to apply our knowledge, such as it is, to practice. It is, also, in some degree, the case in *agriculture*. In the merely speculative parts of physic and chemistry, we may go on patiently accumulating facts, without forming any one conclusion, further than our facts authorize us; and leave to posterity the credit of establishing the theory to which our labors are subservient. But in medicine, in which it is of consequence *to have our knowledge at command*, it seems reasonable to think, that hypothetical theories may be used with advantage; provided always, that they are considered *merely in the light of artificial memories*, and that the student is prepared to lay them aside, or to correct them, in proportion as his knowledge of nature becomes more extensive. I am, indeed, ready to confess, that this is a caution which it is more easy to give, than to follow; for it is painful to change any of our habits of arrangement, and to relinquish those systems in which we have been educated, and which have long flattered us with an idea of our own wisdom. Dr. Gregory mentions it as a striking and distinguishing circumstance in the character of Sydenham, that, although full of hypothetical reasoning, it did not render him the less attentive to observation; and that his hypotheses seem to have sat so loosely about him, that either they did not influence his practice at all, or he could easily abandon them, whenever they would not bend to his experience.

V. *Effects produced on the Memory by committing to writing our acquired knowledge.* — Having treated at considerable length of the improvement of Memory, it may not be improper, before leaving this part of the subject, to consider what effects are likely to be produced on the mind by the practice of committing to writing our acquired knowledge. That such a practice is unfavorable, in some respects, to the faculty of Memory, by superseding, to a certain degree, the necessity of its exertions, has been often remarked, and, I believe, is true; but the advantages with which it is attended in other respects, are so important, as to overbalance greatly this trifling inconvenience.

It is not my intention, at present, to examine and compare together the different methods which have been proposed, of keeping a *commonplace-book*. In this, as in other cases of a similar kind, it may be difficult, perhaps, or impossible, to establish any rules which will apply universally. Individuals must be left to judge for themselves, and to adapt their contrivances to the particular nature of their literary pursuits, and to their own peculiar habits of association and arrangement. The remarks which I am to offer are very general, and are intended merely to illustrate a few of the advantages which the art of writing affords to the philosopher, for recording, in the course of his progress through life, the results of his speculations, and the fruits of his experience.

The utility of writing, in enabling one generation to transmit its discoveries to another, and in thus giving rise to a gradual progress in the species, has been sufficiently illustrated by many authors. Little attention, however, has been paid to another of its effects, which is no less important; I mean, to the foundation which it lays for a perpetual progress in the intellectual powers of the individual.

Advantages of the practice of recording our ideas and experience. — It is to experience, and to our own reflections, that we are indebted for by far the most valuable part of our knowledge; and hence it is, that although in youth the imagination may be more vigorous, and the genius more original, than in advanced years; yet, in the case of a man of observation and inquiry, the judgment may be expected, at least as long as his faculties remain in perfection, to become every day sounder and more enlightened. It is, however, only by the constant practice of writing, that the results of our experience, and the progress of our ideas, can be accurately recorded. If they are trusted merely to the Memory, they will gradually vanish from it like a dream, or will come in time to be so blended with the suggestions of imagination, that we shall not be able to reason from them with any degree of confidence. What improvements in science might we not flatter ourselves with the hopes of accomplishing, had we only activity and industry to treasure up every plausible hint that occurs to us! Hardly a day passes, when many such do not occur to ourselves, or are suggested by others; and detached and insulated as they may appear at present, some of them may, perhaps, afterwards, at the distance of years, furnish the key-stone of an important system.

A long train of reasoning or investigation cannot be prosecuted except in writing. — But it is not only in this point of view, that the philosopher derives advantage from the practice of writing. Without its assistance, he could seldom be able to advance beyond those simple elementary truths which are current in the world, and which form, in the various branches of science, the established creed of the age he lives in. How inconsiderable would have been the progress of mathematicians, in their more abstruse speculations, without the aid of *the algebraical notation;* and to what sublime discoveries have they been led by this beautiful contrivance, which, by relieving the Memory of the effort necessary for recollecting the steps of a long investigation, has enabled them to prosecute an infinite variety of inquiries, to which the unassisted powers of the human mind would have been altogether unequal! In the other sciences, it is true, we have seldom or never occasion to follow out such long chains of consequences as in mathematics; but in these sciences, if the chain of investigation be shorter, it is far more difficult to make the transition from one link to another; and it is only by dwelling long on our ideas, and rendering them perfectly familiar to us, that such transitions can, in most instances, be made with safety. In morals and politics, when we advance a step beyond those elementary truths which are daily presented to us in books or conversation, there is no method of rendering our conclusions familiar to us, but by committing them to writing, and making them frequently the subjects of our meditation. When we have once done so, these conclusions become elementary truths with respect to us; and we may advance from them with confidence to others which are more remote, and which are far beyond the reach of vulgar discovery. By following such a plan, we can hardly fail to have our industry rewarded in due time by some important improvement; and it is only by such a plan, that we can reasonably hope to extend considerably the boundaries of human knowledge. I do not say that these habits of study are equally favorable to brilliancy of conversation. On the contrary, I believe that those men who possess this accomplishment in the highest degree, are such as do not advance beyond elementary truths; or rather, perhaps, who advance only a single step beyond them; that is, who think a little more deeply than the vulgar, but whose conclusions are not so far removed from common opinions, as to render it necessary for them, when called upon to defend them, to exhaust the patience of their hearers, by stating a long train of intermediate ideas. They who have pushed their inquiries much further than the common systems of their times, and have rendered familiar to their own minds the intermediate steps by which they have been led to their conclusions, are too apt to conceive other men to be in the same situation with themselves; and when they mean to instruct, are mortified to find that they are only regarded as paradoxical and visionary. It is but rarely we find a man of very splendid and various conversation to be possessed of a profound judgment, or of great originality of genius.

Nor is it merely to the philosopher, who wishes to distinguish himself by his discoveries, that writing affords a useful instrument of study. Important assistance may be derived from it by all those who wish to impress on their minds the investigations which occur to them in the course of their reading; for although writing may weaken, as I already acknowledge it does, a Memory for detached observations, or for insulated facts, it will be found the only effectual method of fixing in it, permanently, those acquisitions which involve long processes of reasoning.

How what we learn from another may be made our own. — When we are employed in inquiries of our own, the conclusions which we form make a much deeper and more lasting impression on the Memory, than any knowledge which we imbibe passively from another. This is undoubtedly owing, in part, to the effect which the ardor of discovery has, in rousing the activity of the mind, and in fixing its attention; but I apprehend it is chiefly to be ascribed to this, that when we follow out a train of thinking of our own, our ideas are arranged in that order which is most agreeable to our prevailing habits of association. The only method of putting our acquired knowledge on a level, in this respect, with our original speculations, is, after making ourselves acquainted with our author's ideas, to study the subject over again in our own way; to pause, from time to time, in the course of our reading, in order to consider what we have gained; to recollect what the propositions are, which the author wishes to establish, and to examine the different proofs which he employs to support them. In making such an experiment, we commonly find, that the different steps of the process arrange themselves in our minds, in a manner different from that in which the author has stated them; and that, while his argument seems, in some places, obscure, from its conciseness, it is tedious in others, from being unnecessarily expanded. When we have reduced the reasoning to that form which appears to ourselves to be the most natural and satisfactory, we may conclude with certainty, not that this form is better in itself than another, but that it is the best adapted to our Memory. Such reasonings, therefore, as we have occasion frequently to apply, either in the business of life, or in the course of our studies, it is of importance to us to commit to writing, in a language and in an order of our own; and if, at any time, we find it necessary to refresh our recollection on the subject, to have recourse to our own composition, in preference to that of any other author.*

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* [It is a little remarkable that Stewart, in this ingenious disquisition upon the advantages of the practice of writing out our thoughts, should have overlooked that upon which Lord Bacon lays especial stress, when he says, "Reading maketh a full man, conference a ready man, and writing an *exact* man." In no other way, are we so sure of obtaining precision and exactness in our knowledge and in our trains of reasoning and speculation, as by writing out our thoughts and recollections as fast as they occur to us, whether we afterwards carefully examine the manuscript

Different modes of reading. — That the plan of reading which is commonly followed is very different from that which I have been recommending, will not be disputed. Most people read merely to pass an idle hour, or to please themselves with the idea of employment, while their indolence prevents them from any active exertion; and a considerable number, with a view to the display which they are afterwards to make of their literary acquisitions. From whichsoever of these motives a person is led to the perusal of books, it is hardly possible that he can derive from them any material advantage. If he reads merely from indolence, the ideas which pass through his mind will probably leave little or no impression; and if he reads from vanity, he will be more anxious to select striking particulars in the matter or expression, than to seize the spirit and scope of the author's reasoning, or to examine how far he has made any additions to the stock of useful and solid knowledge. "Though it is scarce possible," says Dr. Butler, "to avoid judging, in some way or other, of almost every thing which offers itself to one's thoughts, yet it is certain that many persons, from different causes, never exercise their judgment upon what comes before them, in such a manner as to be able to determine how far it be conclusive. They are perhaps entertained with some things, not so with others; they like, and they dislike; but whether

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or not. In conversation, and even in our studious meditations, the attention is apt to wander from the main subject in hand, gaps and fallacies in reasoning escape unnoticed, and vagueness or uncertainty of expression is apt to dim the truth of which we were just beginning to catch a glimpse. But when we think with the pen in hand, we are compelled to think slowly; we are obliged to pause upon the thought which we are writing out, while at the same time the attention is not allowed to wander from it, so that other related ideas have time to be suggested to us, and we have time to reflect upon these before they are adopted. The necessary effort to retain perspicuity of language tends to give precision to our thoughts; and the idea which was only half formed or vaguely seen when we began to write, soon swells out into harmony and completeness. The effort to instruct others has a similar effect upon the mind with that of writing out our knowledge; hence the force of the old proverb, *docere alios docet doctorem.*]

that which is proposed to be made out, be really made out or not; whether a matter be stated according to the real truth of the case, seems, to the generality of people, a circumstance of little or no importance. Arguments are often wanted for some accidental purpose; but proof, as such, is what they never want, for their own satisfaction of mind, or conduct in life. Not to mention the multitudes who read merely for the sake of talking, or to qualify themselves for the world, or some such kind of reasons, there are, even of the few who read for their own entertainment, and have *a real curiosity to see what is said*, several, which is astonishing, who have *no sort of curiosity to see what is true;* I say curiosity, because it is too obvious to be mentioned how much that religious and sacred attention which is due to truth, and to the important question, what is the rule of life, is lost out of the world.

"For the sake of this whole class of readers, for they are of different capacities, different kinds, and get into this way from different occasions, I have often wished that it had been the custom to lay before people nothing in matters of argument but premises, and leave them to draw conclusions themselves; which, although it could not be done in all cases, might in many.

"The great number of books and papers of amusement, which, of one kind or another, daily come in one's way, have in part occasioned, and most perfectly fall in with and humor, this idle way of reading and considering things. By this means, time, even in solitude, is happily got rid of without the pain of attention; neither is any part of it more put to the account of idleness, (one can scarce forbear saying, is spent with less thought,) than great part of that which is spent in reading."

If the plan of study which I formerly described were adopted, it would, undoubtedly, diminish very much the number of books which it would be possible to turn over; but I am convinced that it would add greatly to the stock of useful and solid knowledge; and, by rendering our acquired ideas in some measure our own, would give us a more ready and practical command of them; not to mention, that if we are possessed of any inventive powers, such exercises would continually furnish them with an opportunity of displaying themselves upon all the different subjects which may pass under our review.

Nothing, in truth, has such a tendency to weaken, not only the powers of invention, but the intellectual powers in general, as a habit of extensive and various reading, without reflection. The activity and force of the mind are gradually impaired, in consequence of disuse; and not unfrequently all our principles and opinions come to be lost, in the infinite multiplicity and discordancy of our acquired ideas.

By confining our ambition to pursue the truth with modesty and candor, and learning to value our acquisitions only as far as they contribute to make us wiser and happier, we may, perhaps, be obliged to sacrifice the temporary admiration of the common dispensers of literary fame; but we may rest assured, that it is in this way only we can hope to make real progress in knowledge, or to enrich the world with useful inventions.

"It requires courage, indeed," as Helvetius has remarked, "to remain ignorant of those useless subjects which are generally valued;" but it is a courage necessary to men who either love the truth, or who aspire to establish a permanent reputation.

VI. *Of artificial Memory.* — By an artificial Memory is meant, a method of connecting in the mind things difficult to be remembered, with the things easily remembered; so as to enable it to retain and to recollect the former, by means of the latter. For this purpose, various contrivances have been proposed, but I think the foregoing definition applies to all of them.

Some sorts of artificial Memory are intended to assist the natural powers of the human mind on particular occasions, which require a more than ordinary effort of recollection; for example, to assist a public speaker to recollect the arrangement of a long discourse. Others have been devised with a view to enable us to extend the circle of our acquired knowledge, and to give us a more ready command of all the various particulars of our information.

The *topical Memory* so much celebrated among the ancient rhetoricians, comes under the former description.

How association may be made to assist Memory. — I already remarked the effect of *sensible objects*, in recalling to the mind the ideas with which it happened to be occupied, at the time when these objects were formerly perceived. In travelling along a road, the sight of the more remarkable scenes we meet with, frequently puts us in mind of the subjects we were thinking or talking of when we last saw them. Such facts, which are perfectly familiar even to the vulgar, might very naturally suggest the possibility of assisting the Memory, by *establishing a connection between the ideas we wish to remember, and certain sensible objects*, which have been found from experience to make a permanent impression on the mind. I have been told of a young woman, in a very low rank of life, who contrived a method of committing to Memory the sermons which she was accustomed to hear, by fixing her attention, during the different heads of the discourse, on different compartments of the roof of the church, in such a manner as that, when she afterwards saw the roof, or recollected the order in which its compartments were disposed, she recollected the method which the preacher had observed in treating his subject. This contrivance was perfectly analogous to the topical Memory of the ancients; an art which, whatever be the opinion we entertain of its use, is certainly entitled, in a high degree, to the praise of ingenuity.

Suppose that I were to fix in my Memory the different apartments in some very large building, and that I had accustomed myself to think of these apartments always in the same invariable order. Suppose further, that in preparing myself for a public discourse, in which I had occasion to treat of a great variety of particulars, I was anxious to fix in my Memory the order I proposed to observe in the communication of my ideas. It is evident, that by a proper division of my subject into heads, and by connecting each head with a particular apartment, (which I could easily do, by conceiving myself to be sitting in the apartment while I was studying the part of my discourse I meant to connect with it,) the habitual order in which these apartments occurred to my thoughts, would present to me, in their proper arrangement, and without any effort on my part, the ideas of which I was to treat. It is also obvious, that a very little practice would enable me to avail myself of this contrivance, without any embarrassment or distraction of my attention.

How far artificial Memory is useful. — As to the utility of this art, it appears to me to depend entirely on the particular object which we suppose the speaker to have in view; whether, as was too often the case with the ancient rhetoricians, to bewilder a judge, and to silence an adversary; or fairly and candidly to lead an audience to the truth. On the former supposition, nothing can possibly give an orator a greater superiority, than the possession of a secret, which, while it enables him to express himself with facility and the appearance of method, puts it in his power, at the same time, to dispose his arguments and his facts in whatever order he judges to be the most proper to mislead the judgment, and to perplex the Memory, of those whom he addresses. And such, it is manifest, is the effect, not only of the topical Memory of the ancients, but of all other contrivances which aid the recollection, upon any principle different from the natural and logical arrangement of our ideas.

To those, on the other hand, who speak with a view to convince or to inform others, it is of consequence that the topics which they mean to illustrate, should be arranged in an order equally favorable to their own recollection and to that of their hearers. For this purpose, nothing is effectual but that method which is suggested by the order of their own investigations; a method which leads the mind from one idea to another, either by means of obvious and striking associations, or by those relations which connect the different steps of a clear and accurate process of reasoning. It is thus only that the attention of an audience can be completely and incessantly engaged, and that the substance of a long discourse can be remembered without effort. And it is thus only that a speaker, after a mature consideration of his subject, can possess a just confidence in his own powers of recollection, in stating all the different premises which lead to the conclusion he wishes to establish.

Various kinds of artificial Memory. — In modern times, such contrivances have been very little, if at all, made use of by public speakers; but various ingenious attempts have been made, to assist the Memory in acquiring and retaining those branches of knowledge which it has been supposed necessary for a scholar to carry always about with him; and which, at the same time, from the number of particular details which they involve, are not calculated, of themselves, to make a very lasting impression on the mind. Of this sort is the *Memoria Technica* of Mr. Grey, in which a great deal of historical, chronological, and geographical knowledge is comprised in a set of verses, which the student is supposed to make as familiar to himself as school-boys do the rules of grammar. These verses are, in general, a mere assemblage of proper names, disposed in a rude sort of measure; some slight alterations being occasionally made on the final syllables of the words, so as to be significant (according to certain principles laid down in the beginning of the work) of important dates, or of other particulars which it appeared to the author useful to associate with the names.

I have heard very opposite opinions with respect to the utility of this ingenious system. The prevailing opinion is, I believe, against it; although it has been mentioned in terms of high approbation by some writers of eminence. Dr. Priestley, whose judgment, in matters of this sort, is certainly entitled to respect, has said, that "it is a method so easily learned, and which may be of so much use in recollecting dates, when other methods are not at hand, that he thinks all persons of a liberal education inexcusable, who will not take the small degree of pains that is necessary to make themselves masters of it; or who think any thing mean, or unworthy of their notice, which is so useful and convenient."

In judging of the utility of this, or of any other contrivance of the same kind, to a particular person, a great deal must depend on the species of Memory which he has received from nature, or has acquired in the course of his early education. Some men, as I already remarked, (especially among those who have been habitually exercised in childhood in getting by heart grammar rules,) have an extraordinary facility in acquiring and retaining the most barbarous and the most insignificant verses; which another person would find as difficult to remember, as the geographical and chronological details of which it is the object of this art to relieve the Memory. Allowing, therefore, the general utility of the art, no one method, perhaps, is entitled to an exclusive preference; as one contrivance may be best suited to the faculties of one person, and a very different one to those of another.

Objection to all expedients of this nature.—One important objection applies to all of them, that they accustom the mind *to associate ideas by accidental and arbitrary connections;* and, therefore, how much soever they may contribute, in the course of conversation, to an ostentatious display of acquired knowledge, they are, perhaps, of little real service to us, when we are seriously engaged in the pursuit of truth. I own, too, I am very doubtful with respect to the utility of a great part of that information which they are commonly employed to impress on the Memory, and on which the generality of learned men are disposed to value themselves. It certainly is of no use, but in so far as it is subservient to the gratification of their vanity; and the acquisition of it consumes a great deal of time and attention, which might have been employed in extending the boundaries of human knowledge. To those, however, who are of a different opinion, such contrivances as Mr. Grey's may be extremely useful; and to all men they may be of service, in fixing in the Memory those insulated and uninteresting particulars which it is either necessary for them to be acquainted with, from their situation, or which custom has rendered, in the common opinion, essential branches of a liberal education. I would, in particular, recommend this author's method of recollecting dates, by substituting letters for the numeral cyphers; and forming these letters into words, and the words into verses. I have found it, at least in my own case, the most effectual of all such contrivances of which I have had experience.

VII. *Importance of making a proper selection among the objects of our knowledge, in order to derive advantage from the acquisitions of Memory.*—The cultivation of Memory, with all the helps that we can derive to it from art, will be of little use to us, unless we make a proper selection of the particulars to be remembered. Such a selection is necessary to enable us to profit by reading; and still more so, to enable us to profit by observation, to which every man is indebted for by far the most valuable part of his knowledge.

When we first enter on any new literary pursuit, we commonly find our efforts of attention painful and unsatisfactory. We have no discrimination in our curiosity; and by grasping at every thing, we fail in making those moderate acquisitions which are suited to our limited faculties. As our knowledge extends, we learn to know what particulars are likely to be of use to us; and acquire a habit of directing our examination to these, without distracting the attention with others. It is partly owing to a similar circumstance, that most readers complain of a defect of Memory, when they first enter on the study of history. They cannot separate important from trifling facts, and find themselves unable to retain any thing, from their anxiety to secure the whole.

How such a selection can best be made. — In order to give a proper direction to our attention in the course of our studies, it is useful, before engaging in particular pursuits, to acquire as familiar an acquaintance as possible with the great outlines of the different branches of science; with the most important conclusions which have hitherto been formed in them, and with the most important desiderata which remain to be supplied. In the case, too, of those parts of knowledge which are not yet ripe for the formation of philosophical systems, it may be of use to study the various hypothetical theories which have been proposed for connecting together and arranging the phenomena. By such general views alone, we can prevent ourselves from being lost amidst a labyrinth of particulars, or can engage in a course of extensive and various reading with an enlightened and discriminating attention. While they withdraw our notice from barren and insulated facts, they direct it to such as tend to illustrate principles which have either been already established, or which, from having that degree of connection among themselves which is necessary to give plausibility to a hypothetical theory, are likely to furnish, in time, the materials of a juster system.

The proper use of hypothetical theories. — Some of the followers of Lord Bacon have, I think, been led, in their zeal for the method of induction, to censure hypothetical theories with too great a degree of severity. Such theories have certainly been frequently of use, in *putting philosophers upon the road of discovery.* Indeed, it has probably been in this way, that most discoveries have been made; for although a knowledge of facts must be prior to the formation of a just theory, yet a hypothetical theory is generally our best guide to the knowledge of useful facts. If a man, without forming to himself any conjecture concerning the unknown laws of nature, were to set himself merely to accumulate facts at random, he might, perhaps, stumble upon some important discovery; but by far the greater part of his labors would be wholly useless. Every philosophical inquirer, before he begins a set of experiments, has some general principle in his view, which he suspects to be a law of nature;* and although his conjectures may be often wrong, yet they serve to give his inquiries a particular direction, and to bring under his eye a number of facts which have a certain relation to each other. It has been often remarked, that the attempts to discover the philosopher's stone, and the quadrature of the circle, have led to many useful discoveries in chemistry and mathematics. And they have plainly done so, merely by limiting the field of observation and inquiry, and checking that indiscriminate and desultory attention which is so natural to an indolent mind. A hypothetical theory, however erroneous, may answer a similar purpose. "Prudens interrogatio," says Lord Bacon, "est dimidium scientiæ. Vaga enim experientia et se tantum sequens mera palpatio est, et homines potius stupefacit quam informat." [A wise conjecture is one half of knowledge. For experimental investigation made at random, and only following itself, is mere groping, and rather confounds than instructs men.] What, indeed, are Newton's queries, but so many hypotheses which are proposed as subjects of examination to philosophers? And did not even the great doctrine of gravitation take its first rise from a fortunate conjecture?

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* "Recte siquidem Plato, 'Qui aliquid quærit, id ipsum, quod quærit, generali quadam notione comprehendit: aliter, qui fieri potest, ut illud, cum fuerit inventum, agnoscat?' Idcirco quo amplior et certior fuerit anticipatio nostra, eo magis directa et compendiosa erit investigatio." — [As Plato justly observes, 'He who is in search of any thing, has some general notion of what it is that he is seeking for; otherwise, how should he recognize it when found?' Therefore, according as our anticipation is full and clear, so will our investigation be brief and direct.] — *De Aug. Scient.* lib. v. cap. 3.

While, therefore, we maintain, with the followers of Bacon, that no theory is to be admitted as proved, any further than it is supported by facts, we should, at the same time, acknowledge our obligations to those writers who hazard their conjectures to the world with modesty and diffidence. And it may not be improper to add, that men of a systematizing turn are not now so useless as formerly; for we are already possessed of a great stock of facts; and there is scarcely any theory so bad, as not to bring together a number of particulars which have a certain degree of relation or analogy to each other.

The foregoing remarks are applicable to all our various studies; whether they are conducted in the way of *reading*, or of *observation*. From neither of these two sources of information can we hope to derive much advantage, unless we have some general principles to direct our attention to proper objects.

What to observe. — With respect to *observation*, some further cautions may be useful; for, in guarding against an indiscriminate accumulation of particulars, it is possible to fall into the opposite extreme, and to acquire a habit of inattention to the phenomena which present themselves to our senses. The former is the error of men of little education; the latter is more common among men of retirement and study.

Danger of withdrawing the attention too much from particulars and details. — One of the chief effects of a liberal education, is, to enable us to withdraw the attention from the present objects of our perceptions, and to dwell at pleasure on the past, the absent, or the future. But when we are led to carry these efforts to an excess, either from a warm and romantic imagination, or from anxious and sanguine temper, it is easy to see that the power of observation is likely to be weakened, and habits of inattention to be contracted. The same effect may be produced by too early an indulgence in philosophical pursuits, before the mind has been prepared for the study of general truths, by exercising its faculties among particular objects and particular occurrences. In this way, it contracts an aversion to the examination of details, from the pleasure which it has experienced in the contemplation or in the discovery of general principles. Both of these turns of thought, however, presuppose a certain degree of observation; for the materials of imagination are supplied by the senses; and the general truths which occupy the philosopher, would be wholly unintelligible to him, if he was a total stranger to all experience with respect to the course of nature and of human life. The observations, indeed, which are made by men of a warm imagination, are likely to be inaccurate and fallacious; and those of the speculative philosopher are frequently carried no further than is necessary to enable him to comprehend the terms which relate to the subjects of his reasoning; but both the one and the other must have looked abroad occasionally at nature, and at the world; if not to ascertain facts by actual examination, at least to store their minds with ideas.

The *metaphysician*, whose attention is directed to the faculties and operations of the mind, is the only man who *possesses within himself the materials of his speculations and reasonings.* It is accordingly, among this class of literary men, that habits of inattention to things external have been carried to the greatest extreme.

It is observed by Dr. Reid, that *the power of reflection*, (by which he means the power of attending to the subjects of our consciousness,) *is the last of our intellectual faculties which unfolds itself;* and that, in the greater part of mankind, it never unfolds itself at all. It is a power, indeed, which being subservient merely to the gratification of metaphysical curiosity, it is not essentially necessary for us to possess, in any considerable degree. *The power of observation,* on the other hand, which is necessary for the preservation even of our animal existence, *discovers itself in infants* long before they attain the use of speech, or rather, I should have said, as soon as they come into the world; and where nature is allowed free scope, it continues active and vigorous through life. It was plainly the intention of nature, that in infancy and youth, it should occupy the mind almost exclusively, and that we should acquire all our necessary information before engaging in speculations which are less essential; and accordingly, this is the history of the intellectual progress, in by far the greater number of individuals. In consequence of this, the difficulty of metaphysical researches is undoubtedly much increased; for the mind, being constantly occupied in the earlier part of life about the properties and laws of matter, acquires *habits of inattention to the subjects of consciousness,* which are not to be surmounted, without a degree of patience and perseverance of which few men are capable; but the inconvenience would evidently have been greatly increased, if the order of nature had, in this respect, been reversed, and if the curiosity had been excited at as early a period, by the phenomena of the intellectual world, as by those of the material. Of what would have happened on this supposition, we may form a judgment from those men who, in consequence of an excessive indulgence in metaphysical pursuits, have weakened, to an unnatural degree, their capacity of attending to external objects and occurrences. Few metaphysicians, perhaps, are to be found, who are not deficient in the power of observation; for, although a taste for such abstract speculations is far from being common, it is more apt, perhaps, than any other, when it has once been formed, to take an exclusive hold of the mind, and to shut up the other sources of intellectual improvement. As the metaphysician carries within himself the materials of his reasonings, he is not under a necessity of looking abroad for subjects of speculation or amusement; and unless he be very careful to guard against the effects of his favorite pursuits, he is in more danger than literary men of any other denomination, to lose all interest about the common and proper objects of human curiosity.

In education, the study of the mind should come last. — To prevent any danger from this quarter, I apprehend that the study of the mind should form the last branch of the education of youth; an order which nature herself seems to point out, by what I have already remarked, with respect to the development of our faculties. After the understanding is well stored with particular facts, and has been conversant with particular scientific pursuits, it will be enabled to speculate concerning its own powers with additional advantage, and will run no hazard of indulging too far in such inquiries. Nothing can be more absurd, on this as well as on many other accounts, than the common practice which is followed in our universities, of beginning a course of philosophical education with the study of logic. If this order were completely reversed; and if the study of logic were delayed till after the mind of the student was well stored with particular facts in physics, in chemistry, in natural and civil history; his attention might be led with the most important advantage, and without any danger to his power of observation, to an examination of his own faculties; which, besides opening to him a new and pleasing field of speculation, would enable him to form an estimate of his own powers, of the acquisitions he has made, of the habits he has formed, and of the further improvements of which his mind is susceptible.

In general, wherever habits of inattention, and an incapacity of observation, are very remarkable, they will be found to have arisen from some defect in early education. I already remarked, that, when nature is allowed free scope, the curiosity, during early youth, is alive to every external object, and to every external occurrence, while the powers of imagination and reflection do not display themselves till a much later period; the former till about the age of puberty, and the latter till we approach to manhood. It sometimes, however, happens that, in consequence of a peculiar disposition of mind, or of an infirm bodily constitution, a child is led to seek amusement from books, and to lose a relish for those recreations which are suited to his age. In such instances, the ordinary progress of the intellectual powers is prematurely quickened; but that best of all educations is lost which nature has prepared both for the philosopher and the man of the world, amidst the active sports and the hazardous adventures of childhood. It is from these alone, that we can acquire, not only that force of character which is suited to the more arduous situations of life, but that complete and prompt command of attention to things external, without which, the highest endowments of the understanding, however they may fit a man for the solitary speculations of the closet, are but of little use in the practice of affairs, or for enabling him to profit by his personal experience.

How habits of inattention to details may be corrected. — Where, however, such habits of inattention have unfortunately been contracted, we ought not to despair of them as perfectly incurable. The attention, indeed, as I formerly remarked, can seldom be forced in particular instances; but we may gradually learn to place the objects we wish to attend to, in lights more interesting than those in which we have been accustomed to view them. Much may be expected from a change of scene, and a change of pursuits; but above all, much may be expected from foreign travel. The objects which we meet with excite our surprise by their novelty; and in this manner, we not only gradually acquire the power of observing and examining them with attention, but, from the effects of contrast, the curiosity comes to be roused with respect to the corresponding objects in our own country, which, from our early familiarity with them, we had formerly been accustomed to overlook. In this respect, the effects of foreign travel, in directing the attention to familiar objects and occurrences, is somewhat analogous to that which the study of a dead or of a foreign language produces, in leading the curiosity to examine the grammatical structure of our own.

Considerable advantage may also be derived, in overcoming the habits of inattention, which we may have contracted to particular subjects, from studying the systems, true or false, which philosophers have proposed for explaining or for arranging the facts connected with them. By means of these systems, not only is the curiosity circumscribed and directed, instead of being allowed to wander at random, but, in consequence of our being enabled to connect facts with general principles, it becomes interested in the examination of those particulars which would otherwise have escaped our notice.

VIII. *Of the connection between Memory and philosophical genius.* — It is commonly supposed, that genius is seldom united with a very tenacious Memory. So far, however, as my own observation has reached, I can scarcely recollect one person who possesses the former of these qualities, without a more than ordinary share of the latter.

On a superficial view of the subject, indeed, the common opinion has some appearance of truth; for, we are naturally led, in consequence of the topics about which conversation is usually employed, to estimate the extent of Memory by the impression which *trivial occurrences* make upon it; and these, in general, escape the recollection of a man of ability, *not because he is unable to retain them, but because he does not attend to them.* It is probable, likewise, that accidental associations, founded on contiguity in time and place, may make but a slight impression on his mind. But it does not, therefore, follow, that his stock of facts is small. They are connected together in his Memory by principles of association different from those which prevail in ordinary minds; and they are, on that very account, the more useful; for as the associations are founded upon real connections among the ideas, (although they may be less conducive to the fluency, and perhaps to the wit, of conversation,) they are of incomparably greater use in suggesting facts which are to serve as a foundation for reasoning or for invention.

It frequently happens, too, that a man of genius, in consequence of a peculiarly strong attachment to a particular subject, may first feel a want of inclination, and may afterwards acquire a want of capacity, of attending to common occurrences. But it is probable, that the whole stock of ideas in his mind is not inferior to that of other men; and that, however unprofitably he may have directed his curiosity, the ignorance which he discovers on ordinary subjects does not arise from a want of Memory, but from a peculiarity in the selection which he has made of the objects of his study.

Montaigne frequently complains in his writings of his want of Memory; and he indeed gives many very extraordinary instances of his ignorance on some of the most ordinary topics of information. But it is obvious to any person who reads his works with attention, that this ignorance did not proceed from an original defect of Memory, but from the singular and whimsical direction which his curiosity had taken at an early period of life. "I can do nothing," says he, "without my memorandum-book; and so great is my difficulty in remembering proper names, that I am forced to call my domestic servants by their offices. I am ignorant of the greater part of our coins in use; of the difference of one grain from another, both in the earth and in the granary; what use leaven is of in making bread, and why wine must stand some time in the vat before it ferments." Yet the same author appears evidently, from his writings, to have had his Memory stored with an infinite variety of apophthegms, and of historical passages, which had struck his imagination; and to have been familiarly acquainted, not only with the names, but with the absurd and exploded opinions of the ancient philosophers; with the ideas of Plato, the atoms of Epicurus, the *plenum* and *vacuum* of Leucippus and Democritus, the water of Thales, the numbers of Pythagoras, the infinite of Parmenides, and the unity of Musæus. In complaining, too, of his want of presence of mind, he indirectly acknowledges a degree of Memory, which, if it had been judiciously employed, would have been more than sufficient for the acquisition of all those common branches of knowledge, in which he appears to have been deficient. "When I have an oration to speak," says he, "of any considerable length, I am reduced to the miserable necessity of getting it, word for word, by heart."

The strange and apparently inconsistent combination of knowledge and ignorance which the writings of Montaigne exhibit, led Malebranche, (who seems to have formed too low an opinion both of his genius and character,) to tax him with affectation; and even to call in question the credibility of some of his assertions. But no one who is well acquainted with this most amusing author, can reasonably suspect his veracity; and, in the present instance, I can give him complete credit, not only from my general opinion of his sincerity, but from having observed, in the course of my own experience, more than one example of the same sort of combination; not, indeed, carried to such a length as Montaigne describes, but bearing a striking resemblance to it.

The observations which have already been made, account, in part, for the origin of the common opinion, that genius and Memory are seldom united in great degrees in the same person; and at the same time show, that some of the facts on which that opinion is founded do not justify such a conclusion. Besides these, however, there are other circumstances, which, at first view, seem rather to indicate an inconsistency between extensive Memory and original genius.

What kind of Memory is possessed by the philosopher. — The species of Memory which excites the greatest degree of admiration in the ordinary intercourse of society, is a Memory for detached and insulated facts; and it is certain that those men who are possessed of it are very seldom distinguished by the higher gifts of the mind. Such a species of Memory is unfavorable to philosophical arrangement; because it in part supplies the place of arrangement. One great use of philosophy, as I already showed, is to give us an extensive command of particular truths, by furnishing us with general principles, under which a number of such truths is comprehended. A person in whose mind casual associations of time and place make a lasting impression, has not the same inducements to philosophize, with others, who connect facts together chiefly by the relations of cause and effect, or of premises and conclusion. I have heard it observed, that those men who have risen to the greatest eminence in the profession of law, have been, in general, such as had at first an aversion to the study. The reason probably is, that to a mind fond of general principles, every study must be at first disgusting, which presents to it a chaos of facts apparently unconnected with each other. But this love of arrangement, if united with persevering industry, will at last conquer every difficulty; will introduce order into what seemed, on a superficial view, a mass of confusion, and reduce the dry and uninteresting detail of positive statutes into a system comparatively luminous and beautiful.

The observation, I believe, may be made more general, and may be applied to every science in which there is a great multiplicity of facts to be remembered. A man destitute of genius may, with little effort, treasure up in his memory a number of particulars in chemistry or natural history, which he refers to no principle, and from which he deduces no conclusion; and from his facility in acquiring this stock of information, may flatter himself with the belief that he possesses a natural taste for these branches of knowledge. But they who are really destined to extend the boundaries of science, when they first enter on new pursuits, feel their attention distracted, and their Memory overloaded, with facts among which they can trace no relation, and are sometimes apt to despair entirely of their future progress. In due time, however, their superiority appears, and arises in part from that very dissatisfaction which they at first experienced, and which does not cease to stimulate their inquiries, till they are enabled to trace, amidst a chaos of apparently unconnected materials, that simplicity and beauty which always characterize the operations of nature.

Inconveniences experienced by men of genius. — There are, besides, other circumstances which retard the progress of a man of genius, when he enters on a new pursuit, and which sometimes render him apparently inferior to those who are possessed of ordinary capacity. A want of curiosity and of invention facilitates greatly the acquisition of knowledge. It renders the mind passive in receiving the ideas of others, and saves all the time which might be employed in examining their foundation, or in tracing their consequences. They who are possessed of much acuteness and originality, enter with difficulty into the views of others; not from any defect in their power of apprehension, but because they cannot adopt opinions which they have not examined; and because their attention is often seduced by their own speculations.

It is not merely in the acquisition of knowledge, that a man of genius is likely to find himself surpassed by others; he has commonly his information much less at command, than those who are possessed of an inferior degree of originality; and, what is somewhat remarkable, he has it least of all at command on those subjects on which he has found his invention most fertile. Sir Isaac Newton, as we are told by Dr. Pemberton, was often at a loss, when the conversation turned on his own discoveries. It is probable that they made but a slight impression on his mind, and that a consciousness of his inventive powers prevented him from taking much pains to treasure them up in his Memory. Men of little ingenuity seldom forget the ideas they acquire; because they know, that, when an occasion occurs for applying their knowledge to use, they must trust to Memory and not to invention. Explain an arithmetical rule to a person of common understanding, who is unacquainted with the principles of the science; he will soon get the rule by heart, and become dexterous in the application of it. Another, of more ingenuity, will examine the principle of the rule before he applies it to use, and will scarcely take the trouble to commit to Memory a process which he knows he can, at any time, with a little reflection, recover. The consequence will be, that, in the practice of calculation, he will appear more slow and hesitating, than if he followed the received rules of arithmetic without reflection or reasoning.

Prompt recollection may be mistaken for readiness of apprehension. — Something of the same kind happens every day in conversation. By far the greater part of the opinions we announce in it, are not the immediate result of reasoning on the spot, but have been previously formed in the closet, or, perhaps, have been adopted implicitly on the authority of others. The promptitude, therefore, with which a man decides in ordinary discourse, is not a certain test of the quickness of his apprehension;* as it may, perhaps, arise from those uncommon efforts to furnish the Memory with acquired knowledge, by which men of slow parts endeavor to compensate for their want of invention; while, on the other hand, it is possible that a consciousness of originality may give rise to a manner apparently embarrassed, by leading the person who feels it, to trust too much to extempore exertions.†

What kind of Memory rarely accompanies original genius. — In general, I believe, it may be laid down as a rule, that those who carry about with them a great degree of acquired information, which they have always at command, or who have rendered their own discoveries so familiar to them, as always to be in a condition to explain them, without recollection, are very seldom possessed of much invention, or even of much quickness of apprehension. A man of original genius, who is fond of exercising his reasoning powers anew on every point as it occurs to him, and who cannot submit to rehearse the ideas of others, or to repeat by rote the conclusions which he has deduced from previous reflection, often appears, to superficial observers, to fall below the level of ordinary understandings; while another, destitute both of quickness and invention, is admired for that promptitude in his decisions, which arises from the inferiority of his intellectual abilities.

It must, indeed, be acknowledged in favor of the last description of men, that in ordinary conversation, they form the most agreeable, and, perhaps, the most instructive companions. How inexhaustible soever the invention of an individual may be, the variety of his own peculiar ideas can bear no proportion to the whole mass of useful and curious information of which the world is already possessed. The conversation, accordingly, of men of genius, is sometimes extremely limited; and is interesting to the few alone, who know the value, and who can distinguish the marks, of originality. In consequence, too, of that partiality which every man feels for his own speculations, they are more in danger of being dogmatical and disputatious, than those who have no system which they are interested to defend.

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* "Memoria facit prompti ingenii famam, ut illa quæ dicimus, non domo attulisse, sed ibi protinus sumpsisse videamur." [A good Memory gives one a reputation for quickness of intellect; for what we say appears not to have been brought with us from home, but to be struck out upon the spot.] — Quinct. *Inst. Orat.* lib. xi. c. 2.

† In the foregoing observations, it is not meant to be implied, that originality of genius is incompatible with a ready recollection of acquired knowledge; but only that it has a tendency unfavorable to it, and that more time and practice will commonly be necessary to familiarize the mind of a man of invention to the ideas of others, or even to the conclusions of his own understanding, than are requisite in ordinary cases. Habits of literary conversation, and still more, habits of extempore discussion in a popular assembly, are peculiarly useful in giving us a ready and practical command of our knowledge.

The same observations may be applied to authors. A book which contains the discoveries of one individual only, may be admired by a few, who are intimately acquainted with the history of the science to which it relates, but it has little chance for popularity with the multitude. An author who possesses industry sufficient to collect the ideas of others, and judgment sufficient to arrange them skilfully, is the most likely person to acquire a high degree of literary fame; and although, in the opinion of enlightened judges, invention forms the chief characteristic of genius, yet it commonly happens, that the objects of public admiration are men who are much less distinguished by this quality, than by extensive learning and cultivated taste. Perhaps, too, for the multitude, the latter class of authors is the most useful; as their writings contain the more solid discoveries which others have brought to light, separated from those errors with which truth is often blended in the first formation of a system.

CHAPTER VII.

OF IMAGINATION.

I. *Analysis of Imagination.* — In attempting to draw the line between *conception* and *imagination,* I have already observed, that the province of the former is to present us with *an exact transcript of what we have formerly felt and perceived;* that of the latter, *to make a selection of qualities and of circumstances* from a variety of different objects, *and by combining and disposing these, to form a new creation of its own.*

According to the definitions adopted in general by modern philosophers, the province of imagination would appear to be limited to objects of *sight.* "It is the sense of sight," says Mr. Addison, "which furnishes the imagination with its ideas; so that, by the pleasures of imagination, I here mean such as arise from visible objects, either when we have them actually in view, or when we call up their ideas into our minds by paintings, statues, descriptions, or any the like occasions. We cannot, indeed, have a single image in the fancy, that did not make its first entrance through the sight." Agreeably to the same view of the subject, Dr. Reid observes, that "imagination properly signifies a lively conception of objects of *sight;* the former power being distinguished from the latter, as a part from the whole."

Imagination not limited to objects of sight. — That this limitation of the province of imagination to one particular class of our perceptions is altogether arbitrary, seems to me to be evident; for, although the greater part of the materials which imagination combines be supplied by this sense, it is nevertheless indisputable, that our other perceptive faculties also contribute occasionally their share. How many pleasing images have been borrowed from the *fragrance* of the fields and the *melody* of the groves; not to mention that sister art, whose magical influence over the human frame it has been, in all ages, the highest boast of poetry to celebrate! In the following passage, even the more gross sensations of *taste* form the subject of an ideal repast, on which it is impossible not to dwell with some complacency, particularly after a perusal of the preceding lines, in which the poet describes "the wonders of the torrid zone."

> "Bear me, Pomona! to thy citron groves;
> To where the lemon and the piercing lime,
> With the deep orange, glowing thro' the green,
> Their lighter glories blend. Lay me reclined
> Beneath the spreading tamarind that shakes,
> Fann'd by the breeze, its fever-cooling fruit:
> Or, stretch'd amid these orchards of the sun,
> O let me drain the cocoa's milky bowl,
> More bounteous far than all the frantic juice
> Which Bacchus pours! Nor, on its slender twigs
> Low bending, be the full pomegranate scorn'd;
> Nor, creeping thro' the woods, the gelid race
> Of berries. Oft in humbler station dwells
> Unboastful worth, above fastidious pomp.
> Witness thou, best Anana, thou the pride
> Of vegetable life, beyond whate'er
> The poets imaged in the golden age:
> Quick let me strip thee of thy spiny coat,
> Spread thy ambrosial stores, and feast with Jove!"
>
> THOMSON.

What an assemblage of other conceptions, different from all those hitherto mentioned, has the genius of Virgil combined in one distich!

> Hic gelidi fontes, hic mollia prata, Lycori,
> Hic nemus: hic ipso tecum consumerer ævo.

Imagination not limited even to the sensible world. — These observations are sufficient to show how inadequate a notion of the province of imagination (considered even in its reference to the sensible world) is conveyed by the definitions of Mr. Addison and of Dr. Reid. But the sensible world, it must be remembered, is not the only field where imagination exerts her powers. All the objects of human knowledge supply materials to her forming hand; diversifying infinitely the works she produces, while the mode of her operation remains essentially uniform. As it is the same power of reasoning which enables us to carry on our investigations with respect to individual objects, and with respect to classes or genera; so it was by the same processes of analysis and combination, that the genius of Milton produced the *garden of Eden*, that of Harrington, *the commonwealth of Oceana*, and that of Shakspeare, *the characters of Hamlet and Falstaff*. The difference between these several efforts of invention, consists only in the manner in which the original materials were acquired; as far as the power of imagination is concerned, the processes are perfectly analogous.

But imaginations of visible objects are most pleasing. — The attempts of Mr. Addison and of Dr. Reid to limit the province of imagination to objects of sight, have plainly proceeded from a very important fact, which it may be worth while to illustrate more particularly. That the mind has a greater facility, and of consequence, a greater delight, in recalling the perceptions of this sense than those of any of the others; while at the same time, the varieties of qualities perceived by it is incomparably greater. It is this sense, accordingly, which supplies the painter and the statuary with *all* the subjects on which their genius is exercised, and which furnishes to the descriptive poet the largest and the most valuable portion of the materials which he combines. In that absurd species of prose composition, too, which borders on poetry, nothing is more remarkable than the predominance of phrases that recall to the memory glaring colors, and those splendid appearances of nature which make a strong impression on the eye. It has been mentioned by different writers, as a characteristical circumstance in the Oriental or Asiaitc style, that the greater part of the metaphors are taken from the celestial luminaries. "The works of the Persians," says M. de Voltaire, "are like the titles of their kings, in which we are perpetually dazzled with the sun and the moon." Sir William Jones, in a short Essay on the Poetry of Eastern Nations, has endeavored to show, that this is not owing to the bad taste of the Asiatics, but to the old language and popular religion of their country. But the truth is, that the very same criticism will be found to apply to the juvenile productions of every author possessed of a warm imagination, and to the compositions of every people among whom a cultivated and philosophical taste has not established a sufficiently marked distinction between the appropriate styles of poetry and of prose.

Agreeably to these principles, Gray, in describing the infantine reveries of poetical genius, has fixed, with exquisite judgment, on this class of our conceptions:—

"Yet oft before his infant eye would run
Such forms as glitter in the Muse's ray
With orient hues——"

From these remarks, it may be easily understood, why the word *imagination*, in its most ordinary acceptation, should be applied to cases where our conceptions are derived from the sense of sight; although the province of this power be, in fact, as unlimited as the sphere of human enjoyment and of human thought. Hence the origin of those partial definitions which I have been attempting to correct; and hence, too, the origin of the word *imagination;* the etymology of which implies manifestly a reference to visible objects.

To all the various modes in which imagination may display itself, the greater part of the remarks contained in this chapter will be found to apply, under proper limitations; but, in order to render the subject more obvious to the reader's examination, I shall, in the further prosecution of it, endeavor to convey my ideas rather by means of particular examples, than in the form of general principles; leaving it to his own judgment to determine, with what modifications the conclusions to which we are led may be extended to other combinations of circumstances.

Among the innumerable phenomena which this part of our constitution presents to our examination, the combinations which the mind forms out of materials supplied by the power of conception recommend themselves strongly, both by their simplicity, and by the interesting nature of the discussions to which they lead. I shall avail myself, therefore, as much as possible, in the following inquiries, of whatever illustrations I am able to borrow from the arts of *poetry* and of *painting;* the operations of imagination in these arts furnishing the most intelligible and pleasing exemplifications of the intellectual processes, by which, in those analogous but less palpable instances that fall under the consideration of the moralist, the mind deviates from the models presented to it by experience, and forms to itself new and untried objects of pursuit. It is in consequence of such processes, (which, how little soever they may be attended to, are habitually passing in the thoughts of all men,) that human affairs exhibit so busy and so various a scene; tending, in one case, to improvement, and, in another, to decline; according as our notions of excellence and of happiness are just or erroneous.

What powers of the mind are included in imagination.— It was observed in a former part of this work, that imagination is a complex power. It includes *conception* or *simple apprehension*, which enables us to form a notion of those former objects of perception or of knowledge, out of which we are to make a selection; *abstraction*, which separates the selected materials from the qualities and circumstances which are connected with them in nature; and *judgment* or *taste*, which selects the materials, and directs their combination. To these powers, we may add, that particular habit of association to which I formerly gave the name of *fancy;* as it is this which presents to our choice all the different materials which are subservient to the efforts of imagination, and which may, therefore, be considered as forming the groundwork of poetical genius.*

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* [Stewart's analysis of imagination, as far as it goes, agrees with that of Cousin; but the latter writer adds, that *a lively sensibility* to the emotions of taste is also an essential element in the exercise of the imaginative faculty. After enumerating, as Stewart has done, *conception*, (or the image-forming memory, as Cousin calls it,) *abstraction*, and *judgment* in forming new combinations, as powers included under this faculty, he asks, "But is not imagination something more than these? If a man should remember all the images of the past, and should unite to this great memory a

To illustrate these observations, let us consider the steps by which Milton must have proceeded in creating his *imaginary garden of Eden.* When he first proposed to himself that subject of description, it is reasonable to suppose, that a variety of the most striking scenes which he had seen crowded into his mind. The association of ideas suggested them, and the power of conception placed each of them before him, with all its beau-

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power of voluntary abstraction, and a choice among all the materials of his experience, would he, therefore, be endowed with the creative faculty? I think not. The philosophers from whom I borrow this theory seem to me to have omitted one of the main elements which make up the function of imagination: this is, the judgment and the feeling of the beautiful,—the pure love which ought to aid the work of the intellect and the memory, and to infuse its own warmth into both of them. To remember, to abstract, and to combine, is not to have imagination; if it were so, the cool mathematician, who goes on from one deduction to another, and from one theorem to another, ought to be considered an artist. Whether my memory calls up spontaneously objects with their forms, or whether, by the force of my will, I call them up myself, and when these images are evoked, though I have the power of abstracting them, and combining them anew,—in all this, I see nothing but memory and reason. But is it with reason and memory alone, that you will make a Michael Angelo or a Raphael? Would it be enough for Corneille to remember the historical facts, and to combine them artistically, in order to make his tragedy of the Horatii? Besides a great memory and a powerful intellect, there was needed for these great men a measure of enthusiasm, of love — not that vulgar love which depends on physical sensibility — but the pure and disinterested love which we have denominated the sentiment of the beautiful. . . . Men are very nearly equal to each other in respect to memory, reason, and will; but they possess in very unequal degrees the power of imagination; because some of them remain cold and unaffected in presence of the objects, cold in the remembrance of them, cold in their abstractions and combinations; while others, deeply touched at the sight of beauty, preserve, through the operations of memory and the voluntary combination of images, the same vivacity of emotion, the same warmth of sentiment." — *Du Vrai, du Beau, et du Bien.*

On the other hand, Sir William Hamilton, in remarking on the doctrine of the incompatibility of creative imagination and philosophical talent, as held by Hume, Kant, and Reid, says, "There is required, however, for the metaphysician, not less imagination than for the poet, though of a different kind; it may, in fact, be doubted whether Homer or Aristotle possessed this faculty in greater vigor." — *Notes to Reid.*]

ties and imperfections. In every natural scene, if we destine it for any particular purpose, there are defects and redundancies, which art may sometimes, but cannot always, correct. But the power of imagination is unlimited. She can create and annihilate, and dispose, at pleasure, her woods, her rocks, and her rivers. Milton, accordingly, would not copy his Eden from any one scene, but would select from each the features which were most eminently beautiful. The power of abstraction enabled him to make the separation, and taste directed him in the selection. Thus he was furnished with his materials; by a skilful combination of which, he has created a landscape, more perfect, probably, in all its parts, than was ever realized in nature; and certainly very different from any thing which this country exhibited at the period when he wrote. It is a curious remark of Mr. Walpole, that Milton's Eden is free from the defects of the old English garden, and is imagined on the same principles which it was reserved for the present age to carry into execution.

From what has been said, it is sufficiently evident, that imagination is not a simple power of the mind, like attention, conception, or abstraction; but that it is formed by a combination of various faculties. It is further evident, that *it must appear under very different forms, in the case of different individuals;* as some of its component parts are liable to be greatly influenced by habit, and other accidental circumstances. The variety, for example, of the materials out of which the combinations of the poet or the painter are formed, will depend much on the tendency of external situation to store the mind with a multiplicity of conceptions; and the beauty of these combinations will depend entirely on the success with which the power of taste has been cultivated. What we call, therefore, the power of *imagination, is not the gift of nature, but the result of acquired habits,* aided by favorable circumstances. It is not an original endowment of the mind, but an accomplishment formed by experience and situation; and which, in its different gradations, fills up all the interval between the first efforts of untutored genius, and the sublime creations of Raphael or of Milton.

An uncommon degree of imagination constitutes *poetical genius;* a talent which, although chiefly displayed in poetical composition, is also the foundation (though not precisely in the same manner) of various other arts. A few remarks on the relation which imagination bears to some of the most interesting of these, will throw additional light on its nature and office.

II. *Of imagination considered in its relation to some of the fine arts.* — Among the arts connected with imagination, *some* not only take their rise from this power, but produce objects which are addressed to it. *Others* take their rise from imagination, but produce objects which are addressed to the power of *perception.*

(1.) *Landscape gardening.* — To the latter of these two classes of arts belongs that of *gardening;* or, as it has been lately called, the art of creating landscape. In this art, the designer is limited in his creation by nature; and his only province is to correct, to improve, and to adorn. As he cannot repeat his experiments, in order to observe the effect, he must call up, in his imagination, the scene which he means to produce; and apply to his imaginary scene his taste and his judgment; or, in other words, to a lively conception of visible objects, he must add a power (which long experience and attentive observation alone can give him) of judging beforehand, of the effect which they would produce, if they were actually exhibited to his senses. This power forms what Lord Chatham beautifully and expressively called *the prophetic eye of Taste;* that eye which (if I may borrow the language of Mr. Gray) "sees all the beauties that a place is susceptible of, long before they are born; and when it plants a seedling, already sits under the shade of it, and enjoys the effect it will have from every point of view that lies in the prospect." But although the artist who creates a landscape copies it from his imagination, *the scene* which he exhibits *is addressed to the senses,* and may produce its full effect on the minds of others, without any effort on their part, either of imagination or of conception.

To prevent being misunderstood, it is necessary for me to remark, that, in the last observation, I speak merely of the natural effects produced by a landscape, and abstract entirely from the pleasure which may result from an accidental association of ideas with a particular scene. The effect resulting from such associations will depend, in a great measure, on the liveliness with which the associated objects are conceived, and on the affecting nature of the pictures which a creative imagination, when once roused, will present to the mind; but the pleasures thus arising from the accidental exercise that a landscape may give to the imagination, must not be confounded with those which it is naturally fitted to produce.

(2.) *Painting.* — In painting, (excepting in those instances in which it exhibits a faithful copy of a particular object,) the original idea must be formed in the imagination; and, in most cases, the exercise of *imagination must concur with perception,* before the picture can produce that effect on the mind of the spectator which the artist has in view. Painting, therefore, does not belong entirely to either of the two classes of arts formerly mentioned, but has something in common with them both.

As far as the painter aims at copying exactly what he sees, he may be guided mechanically by general rules; and he requires no aid from that creative genius which is characteristical of the poet. The pleasure, however, which results from painting, considered merely as an imitative art, is extremely trifling; and is specifically different from that which it aims to produce by awaking the imagination. Even in portrait-painting, the servile copyist of nature is regarded in no higher light than that of a tradesman. " Deception," as Reynolds has excellently observed, " instead of advancing the art, is, in reality carrying it back to its infant state. The first essays of painting were certainly nothing but mere imitations of individual objects; and when this amounted to a deception, the artist had accomplished his purpose."

When the history or the landscape painter indulges his genius in forming new combinations of his own, he vies with the poet in the noblest exertion of the poetical art; and he avails himself of his professional skill, as the poet avails himself of language, only to convey the ideas in his mind. To deceive the eye by accurate representations of particular forms, is no longer his aim; but, by the touches of an expressive pencil, to speak to the imaginations of others. *Imitation*, therefore, *is not the end* which he proposes to himself, *but the means* which he employs in order to accomplish it; nay, if the imitation be carried so far as to preclude all exercise of the spectator's imagination, it will disappoint, in a great measure, the purpose of the artist.

(3.) *Poetry.* — In poetry, and in every other species of composition, in which one person attempts, by means of language, to present to the mind of another the objects of his own imagination, this power is necessary, though not in the same degree, to the author and to the reader. When we peruse a description, we naturally feel a disposition to form, in our own minds, a distinct picture of what is described; and in proportion to the attention and interest which the subject excites, the picture becomes steady and determinate. It is scarcely possible for us to hear much of a particular town without forming some notion of its figure and size and situation; and in reading history and poetry, I believe it seldom happens that we do not annex imaginary appearances to the names of our favorite characters. It is, at the same time, almost certain, that the imaginations of no two men coincide upon such occasions; and, therefore, though both may be pleased, the agreeable impressions which they feel, may be widely different from each other, according as the pictures by which they are produced are more or less happily imagined. Hence it is, that when a person accustomed to dramatic reading sees, for the first time, one of his favorite characters represented on the stage, he is generally dissatisfied with the exhibition, however eminent the actor may be; and if he should happen, before this representation, to have been very familiarly acquainted with the character, the case may continue to be the same through life. For my own part, I have never received from any Falstaff on the stage half the pleasure which Shakspeare gives me in the closet; and I am persuaded that I should feel some degree of uneasiness, if I were present at any attempt to personate the figure or the voice of Don Quixote or Sancho Panza. It is not always that the actor, on such occasions, falls short of our expectation. He disappoints us, by exhibiting something different from what our imagination had anticipated, and which consequently appears to us, at the moment, to be an unfaithful representation of the poet's idea; and until a frequent repetition of the performance has completely obliterated our former impressions, it is impossible for us to form an adequate estimate of its merit.

Similar observations may be applied to other subjects. The sight of any natural scene, or of any work of art, provided we have not previously heard of it, commonly produces a greater effect at first, than ever afterwards: but if, in consequence of a description, we have been led to form a previous notion of it, I apprehend, the effect will be found less pleasing the first time it is seen, than the second. Although the description should fall short greatly of the reality, yet the disappointment which we feel, on meeting with something different from what we expected, diminishes our satisfaction. The second time we see the scene, the effect of novelty is, indeed, less than before; but it is still considerable, and the imagination now anticipates nothing which is not realized in the perception.

Why poetry is not so generally relished as landscape gardening. — The remarks which have been made, afford a satisfactory reason why so few are to be found who have a genuine relish for the beauties of poetry. The designs of Kent and of Brown [distinguished landscape gardeners] evince in their authors a degree of imagination entirely analogous to that of the descriptive poet; but when they are once executed, their beauties (excepting those which result from association) meet the eye of every spectator. In poetry, the effect is inconsiderable, unless upon a mind which possesses some degree of the author's genius; a mind amply furnished, by its previous habits, with the means of interpreting the language which he employs; and able, by its own imagination, to coöperate with the efforts of his art.

Different ideas raised by the same words in different minds. — It has been often remarked, that the general words which express complex ideas, seldom convey precisely the same meaning to different individuals, and that hence arises much of the ambiguity of language. The same observation holds, in no inconsiderable degree, with respect to the names of sensible objects. When the words river, mountain, grove, occur in a description, a person of lively conceptions naturally thinks of some particular river, mountain, and grove, that have made an impression on his mind; and whatever the notions are, which he is led by his imagination to form of these objects, they must necessarily approach to the standard of what he has seen. Hence it is evident that, according to the different habits and education of individuals, according to the liveliness of their conceptions, and according to the creative power of their imaginations, the same words will produce very different effects on different minds. When a person who has received his education in the country, reads a description of a rural retirement, the house, the river, the woods, to which he was first accustomed, present themselves spontaneously to his conception, accompanied, perhaps, with the recollection of his early friendships, and all those pleasing ideas which are commonly associated with the scenes of childhood and of youth. How different is the effect of the description upon his mind, from what it would produce on one who has passed his tender years at a distance from the beauties of nature, and whose infant sports are connected in his memory with the gloomy alleys of a commercial city!

But it is not only in interpreting the particular words of a description, that the powers of imagination and conception are employed. They are further necessary for filling up the different parts of that picture, of which the most minute describer can only trace the outline. In the best description, there is much left to the reader to supply; and the effect which it produces on his mind will depend, in a considerable degree, on the invention and taste with which the picture is finished. It is therefore possible, on the one hand, that the happiest efforts of poetical genius may be perused with perfect indifference by a man of sound judgment, and not destitute of natural sensibility; and on the other hand, that a cold and common-place description may be the means of awakening, in a rich and glowing imagination, a degree of enthusiasm unknown to the author.

The object of all the fine arts is to please. — All the different arts, which I have hitherto mentioned as taking their rise from the imagination, have this in common, that their primary object is to please. This observation applies to the art of poetry, no less than to the others; nay, it is this circumstance which characterizes poetry, and distinguishes it from all the other classes of literary composition. The object of the *philosopher* is to inform and enlighten mankind; that of the *orator*, to acquire an ascendant over the will of others, by bending to his own purposes their judgments, their imaginations, and their passions: but the primary and the distinguishing aim of the *poet* is, to *please;* and the principal resource which he possesses for this purpose, is by addressing the imagination. Sometimes, indeed, he may seem to encroach on the province of the philosopher or of the orator; but, in these instances, he only borrows from them the means by which he accomplishes his end. If he attempts to enlighten and to inform, he addresses the understanding only as a vehicle of pleasure; if he makes an appeal to the passions, it is only to passions which it is pleasing to indulge. The philosopher, in like manner, in order to accomplish his end of instruction, may find it expedient, occasionally, to amuse the imagination, or to make an appeal to the passions; the orator may, at one time, state to his hearers a process of reasoning; at another, a calm narrative of facts; and at a third, he may give the reins to poetical fancy. But still the ultimate end of the philosopher is to instruct, and of the author to persuade; and whatever means they make use of which are not subservient to this purpose, are out of place, and obstruct the effect of their labors.

Why rhythmical language is employed. — The measured composition in which the poet expresses himself, is only one of the means which he employs to please. As the delight which he conveys to the imagination is heightened by the other agreeable impressions, which he can unite in the mind at the same time;

he studies to bestow, upon the medium of communication which he employs, all the various beauties of which it is susceptible. Among these beauties, the harmony of numbers is not the least powerful; for its effect is constant, and does not interfere with any of the other pleasures which language produces. A succession of agreeable perceptions is kept up by the organical effect of words upon the ear; while they inform the understanding by their perspicuity and precision, or please the imagination by the pictures they suggest, or touch the heart by the associations they awaken. Of all these charms of language the poet may avail himself; and they are all so many instruments of his art. To the philosopher and the orator, they may *occasionally* be of use; and to both, they must be *constantly* so far an object of attention, that nothing may occur in their compositions, which may distract the thoughts, by offending either the ear or the taste; but the poet must not rest satisfied with this negative praise. Pleasure is the end of his art; and the more numerous the sources of it which he can open, the greater will be the effect produced by the efforts of his genius.

Poetry has a wider range than the other fine arts. — The province of the poet is limited only by the variety of human enjoyments. Whatever is, in the reality, subservient to our happiness, is a source of pleasure when presented to our conceptions, and may sometimes derive from the heightenings of imagination a momentary charm, which we exchange with reluctance for the substantial gratification of the senses. The province of the painter and of the statuary is confined to the imitation of visible objects, and to the exhibition of such intellectual and moral qualities, as the human body is fitted to express. In ornamental architecture, and in ornamental gardening, the sole aim of the artist is to give pleasure to the eye, by the beauty or sublimity of material forms. But to the poet, all the glories of external nature; all that is amiable, or interesting, or respectable in human character; all that excites and engages our benevolent affections; all those truths which make the heart feel itself better and more happy; — all these supply materials, out of which he forms and peoples a world of his own, where no inconveniences damp our enjoyments, and where no clouds darken our prospects.

Edmund Burke's theory of poetry stated and controverted.— That the pleasures of poetry arise chiefly from the agreeable feelings which it conveys to the mind, by awakening the imagination, is a proposition which may seem too obvious to stand in need of proof. As the ingenious inquirer, however, into "the Origin of our Ideas of the Sublime and Beautiful," [Edmund Burke,] has disputed the common notions on this subject, I shall consider some of the principal arguments by which he has supported his opinion.

The leading principle of the theory which I am now to examine is, "That *the common effect of poetry is not to raise ideas of things;*" or, as I would rather choose to express it, its common effect is not to give exercise to the powers of conception and imagination. That I may not be accused of misrepresentation, I shall state the doctrine at length in the words of the author. "If words have all their possible extent of power, three effects arise in the mind of the hearer. The first is the *sound*, the second, the *picture* or representation of the thing signified by the sound, the third is, the *affection* of the soul produced by one or by both of the foregoing. Compounded abstract words, (*honor*, *justice*, *liberty*, and the like,) produce the first and the last of these effects, but not the second. Simple abstracts are used to signify some one simple idea, without much adverting to others which may chance to attend it; as *blue*, *green*, *hot*, *cold*, and the like: these are capable of affecting all three of the purposes of words; as the aggregate words, *man*, *castle*, *horse*, etc. are, in a yet higher degree. But I am of opinion, that the most general effect even of these words does not arise from their forming pictures of the general things they would represent in the imagination; because, on a very diligent examination of my own mind, and getting others to consider theirs, I do not find that, once in twenty times, any such picture is formed; and when it is, there is most commonly a particular effort of the imagination for that purpose. But the aggregate words operate, as I said of the compound abstracts, not by presenting any image to the mind, but by having, from use, the same effect on being *mentioned*, that their original has when it is *seen*. Suppose we were to read a passage to this effect: 'The river Danube rises in a moist and mountainous soil in the heart of Germany, where, winding to and fro, it waters several principalities, until, turning into Austria, and leaving the walls of Vienna, it passes into Hungary; there, with a vast flood, augmented by the Saave and the Drave, it quits Christendom, and, rolling through the barbarous countries which border on Tartary, it enters by many mouths into the Black Sea.' In this description, many things are mentioned; as mountains, rivers, cities, the sea, etc. But let anybody examine himself, and see whether he has had impressed on his imagination any pictures of a river, mountain, watery soil, Germany, etc. Indeed, it is impossible, in the rapidity and quick succession of words in conversation, to have ideas both of the sound of the word, and of the thing represented; besides, some words expressing real essences are so mixed with others of a general and nominal import, that it is impracticable to jump from sense to thought, from particulars to generals, from things to words, in such a manner as to answer the purposes of life; nor is it necessary that we should."

In further confirmation of this doctrine, Mr. Burke refers to the poetical works of the late amiable and ingenious Dr. Blacklock [the blind poet]. "*Here*," says he, "*is a poet, doubtless as much affected by his own descriptions as any that reads them can be;* and yet he is affected with this strong enthusiasm, by things of which he neither has, nor can possibly have, any idea, further than that of a bare sound; and why may not those who read his works be affected in the same manner that he was, with as little of any real ideas of the things described?"

Some words do not raise ideas, but only excite emotions. — Before I proceed to make any remarks on these passages, I must observe in general, that I perfectly agree with Mr. Burke, in thinking that a very great proportion of the words which we habitually employ, have no effect to raise ideas in the mind; or to exercise the powers of conception and imagination. My notions on this subject I have already sufficiently explained in treating of *abstraction*.

I agree with him further, that a great proportion of the words which are used in poetry and eloquence, more especially, I think, in the latter, produce very powerful effects on the mind, by exciting emotions which we have been accustomed to associate with particular sounds, without leading the imagination to form to itself any pictures or representations; and his account of the manner in which such words operate, appears to me satisfactory. "Such words are, in reality, but mere sounds; but they are sounds, which, being used on particular occasions, wherein we receive some good, or suffer some evil; or see others affected with good or evil; or which we hear applied to other interesting things or events; and being applied in such a variety of cases that we know readily by habit to what things they belong, they produce in the mind, whenever they are afterwards mentioned, effects similar to those of their occasions. The sounds being often used without reference to any particular occasion, and carrying still their first impressions, they at last utterly lose their connection with the particular occasions that gave rise to them; yet the sound, without any annexed notion, continues to operate as before."

But words in poetry must raise emotions and ideas also.— Notwithstanding, however, these concessions, I cannot admit that it is in this way poetry produces its principal effect. Whence is it that general and abstract expressions are so tame and lifeless, in comparison of those which are particular and figurative? Is it not because the former do not give any exercise to the imagination, like the latter? Whence the distinction, acknowledged by all critics ancient and modern, between that charm of words which evaporates in the process of translation, and those permanent beauties, which, presenting to the mind the distinctness of a picture, may impart pleasure to the most remote regions and ages? Is it not, that in the one case, the poet addresses himself to associations which are local and temporary; in the other, to those essential principles of human nature, from which poetry and painting derive their common attractions?

Hence, among the various sources of the sublime, the peculiar stress laid by Longinus on what he calls *Visions*, (*φαντασίαι*) — *ὅταν ἃ λέγης ὑπ’ ἐνθουσιασμοῦ καὶ πάθους βλέπειν δοκῆς, και ὑπ’ ὄψιν τιθῆς τοῖς ἀκούσιν*, [when you seem, from enthusiasm and strong feeling, actually to see the things spoken of, and to place them before the eyes of your hearers.]

Different aims of philosophical and rhetorical composition. — In treating of abstraction, I formerly remarked, that the perfection of philosophical style is to approach as nearly as possible to that species of language we employ in algebra, and to exclude every expression which has a tendency to divert the attention by exciting the imagination, or to bias the judgment by casual associations. For this purpose, the philosopher ought to be sparing in the employment of figurative words, and to convey his notions by general terms which have been accurately defined. To the orator, on the other hand, when he wishes to prevent the cool exercise of the understanding, it may, on the same account, be frequently useful to delight or to agitate his hearers, by blending with his reasonings the illusions of poetry, or the magical influence of sounds consecrated by popular feelings. A regard to the different ends thus aimed at in philosophical and in rhetorical composition, renders the ornaments which are so becoming in the one, inconsistent with good taste and good sense when adopted in the other.

In poetry, as truths and facts are introduced, not for the purpose of information, but to convey pleasure to the mind, nothing offends more, than those general expressions which form the great instrument of philosophical reasoning. The original pleasures, which it is the aim of poetry to recall to the mind, are all derived from individual objects; and, of consequence, (with a very few exceptions, which it does not belong to my present subject to enumerate,) the more particular and the more appropriated its language is, the greater will be the charm it possesses.

With respect to the description of the course of the Danube already quoted, I shall not dispute the result of the experiment to be as the author represents it. That words may often be applied to their proper purposes, without our annexing any particular notions to them, I have formerly shown at great length; and I admit that the meaning of this description may be so understood. But to be understood is not the sole object of the poet; his primary object is to please; and the pleasure which he conveys will, in general, be found to be proportioned to the beauty and liveliness of the images which he suggests. In the case of a poet born blind, the effect of poetry must depend on other causes; but whatever opinion we may form on this point, it appears to me impossible that such a poet should receive, even from his own descriptions, the same degree of pleasure which they may convey to a reader who is capable of conceiving the scenes which are described. Indeed, this instance which Mr. Burke produces in support of his theory, is sufficient of itself to show, that the theory cannot be true in the extent in which it is stated.

Great effect of picturesque phraseology in poetry. — By way of contrast to the description of the Danube, I shall quote a stanza from Gray, which affords a very beautiful example of the two different effects of poetical expression. The pleasure conveyed by the two last lines resolves almost entirely into Mr. Burke's principles; but great as this pleasure is, how inconsiderable is it, in comparison of that arising from the continued and varied exercise which the preceding lines give to the imagination.

> "In climes beyond the solar road,
> Where shaggy forms o'er ice-built mountains roam,
> The Muse has broke the twilight-gloom,
> To cheer the shiv'ring native's dull abode.
> And oft, beneath the od'rous shade
> Of Chili's boundless forests laid,
> She deigns to hear the savage youth repeat,
> In loose numbers wildly sweet,
> Their feather-cinctur'd chiefs and dusky loves.
> Her track, where'er the goddess roves,
> Glory pursue, and generous shame,
> Th' unconquerable mind, and freedom's holy flame."

I cannot help remarking further, the effect of the solemn and uniform flow of the verse in this exquisite stanza, in retarding the pronunciation of the reader, so as to arrest his attention to every successive picture, till it has time to produce its proper impression. More of the charm of poetical rhythm arises from this circumstance, than is commonly imagined.

To those who wish to study the theory of poetical expression, no author in our language affords a richer variety of illustrations than the poet last quoted. His merits, in many other respects, are great; but his skill in this particular is more peculiarly conspicuous. How much he had made the principles of this branch of his art an object of study, appears from his letters published by Mr. Mason.

I have sometimes thought, that, in the last line of the following passage, he had in view the two different effects of words already described; the effect of some, in awakening the powers of conception and imagination; and that of others, in exciting associated emotions: —

> " Hark, his hands the lyre explore!
> Bright-ey'd Fancy, hovering o'er,
> Scatters from her pictur'd urn
> Thoughts that breathe, and words that burn."

III. *Relation of imagination and of taste to genius.* — From the remarks made in the foregoing sections, it is obvious, in what manner a person accustomed to analyze and combine his conceptions, may acquire an idea of beauties superior to any which he has seen realized. It may also be easily inferred, that a habit of forming such intellectual combinations, and of remarking their effects on our own minds, must contribute to refine and to exalt the taste, to a degree which it never can attain in those men, who study to improve it by the observation and comparison of external objects only.

What constitutes genius in the fine arts. — A cultivated taste, combined with a creative imagination, constitutes genius in the fine arts. Without taste, imagination could produce only a random analysis and combination of our conceptions; and without imagination, taste would be destitute of the faculty of invention. These two ingredients of genius may be mixed together in all possible proportions; and where either is possessed in a degree remarkably exceeding what falls to the ordinary share of mankind, it may compensate, in some measure, for a deficiency in the other. An uncommonly correct taste, with little imagination, if it does not produce works which excite admiration, produces at least nothing which can offend. An uncommon fertility of imagination, even when it offends, excites our wonder by its creative power; and shows what it could have performed, had its exertions been guided by a more perfect model.

In the infancy of the arts, a union of these two powers in the same mind is necessary for the production of every work of genius. Taste, without imagination, is, in such a situation, impossible; for, as there are no monuments of ancient genius on which it can be formed, it must be the result of experiments, which nothing but the imagination of every individual can enable him to make. Such a taste must necessarily be imperfect, in consequence of the limited experience of which it is the result; but, without imagination, it could not have been acquired even in this imperfect degree.

In the progress of the arts, the case comes to be altered. The productions of genius accumulate to such an extent, that taste may be formed by a careful study of the works of others; and, as formerly imagination had served as a necessary foundation for taste, so taste begins now to invade the province of imagination. The combinations which the latter faculty has been employed in making, during a long succession of ages, approach to infinity; and present such ample materials to a judicious selection, that, with a high standard of excellence continually present to the thoughts, industry, assisted by the most moderate degree of imagination, will, in time, produce performances not only more free from faults, but incomparably more powerful in their effects, than the most original efforts of untutored genius, which, guided by an uncultivated taste, copies after an inferior model of perfection. What Reynolds observes of painting, may be applied to all the other fine arts; that "as the painter, by bringing together, in one piece, those beauties, which are dispersed amongst a great variety of individuals, produces a figure more beautiful than can be found in nature; so that artist who can unite in himself the excellences of the various painters, will approach nearer to perfection than any of his masters."

IV. *Of the influence of imagination on human character and happiness.* — Hitherto we have considered the power of imagination chiefly as it is connected with the fine arts. But it deserves our attention still more, on account of its extensive influence on human character and happiness.

The lower animals, as far as we are able to judge, are entirely occupied with the objects of their present perceptions; and the case is nearly the same with the inferior orders of our own species. One of the principal effects which a liberal education produces on the mind, is, to accustom us to withdraw our attention from the objects of sense, and to direct it at pleasure to those intellectual combinations which delight the imagination. Even, however, among men of cultivated understandings, this faculty is possessed in very unequal degrees by different individuals; and these differences (whether resulting from original constitution or from early education) lay the foundation of some striking varieties in human character.

Sensibility dependent on imagination. — What we commonly call *sensibility* depends in a great measure on the power of imagination. Point out to two men any object of compassion; — a man, for example, reduced by misfortune from easy circumstances to indigence. The one feels merely in proportion to what he perceives by his senses. The other follows, in imagination, the unfortunate man to his dwelling, and partakes with him and his family in their domestic distresses. He listens to their conversation, while they recall to remembrance the flattering prospects they once indulged; the circle of friends they had been forced to leave; the liberal plans of education which were begun and interrupted; and pictures out to himself all the various resources which delicacy and pride suggest to conceal poverty from the world. As he proceeds in the painting, his sensibility increases, and he weeps, not for what he sees, but for what he imagines. It will be said that it was his sensibility which originally roused his imagination; and the observation is undoubtedly true; but it is equally evident, on the other hand, that the warmth of his imagination increases and prolongs his sensibility.

This is beautifully illustrated in the Sentimental Journey of Sterne. While engaged in a train of reflections on the state-prisons in France, the accidental sight of a starling in a cage suggests to him the idea of a captive in his dungeon. He indulges his imagination, "and looks through the twilight of the grated door to take the picture."

"I beheld," says he, "his body half wasted away with long expectation and confinement, and felt what kind of sickness of the heart it is, which arises from hope deferred. Upon looking nearer, I saw him pale and feverish: in thirty years, the western breeze had not once fanned his blood: he had seen no sun, no moon, in all that time, nor had the voice of friend or kinsman breathed through his lattice. His children — But here my heart began to bleed, and I was forced to go on with another part of the portrait.

"He was sitting upon the ground, in the furthest corner of his dungeon, on a little straw, which was alternately his chair and bed: a little calendar of small sticks was laid at the head, notched all over with the dismal days and nights he had passed there; he had one of these little sticks in his hand, and with a rusty nail, was etching another day of misery to add to the heap. As I darkened the little light he had, he lifted up a hopeless eye towards the door, then cast it down, shook his head, and went on with his work of affliction."

Why pity is excited by fiction more than by reality. — The foregoing observations may account, in part, for the effect which exhibitions of fictitious distress produce on some persons, who do not discover much sensibility to the distresses of real life. In a novel or a tragedy, the picture is completely finished in all its parts; and we are made acquainted not only with every circumstance on which the distress turns, but with the sentiments and feelings of every character, with respect to his situation. In real life, we see, in general, only detached scenes of the tragedy; and the impression is slight unless imagination finishes the characters, and supplies the incidents that are wanting.

Imagination increases our sympathy with others.—It is not only to scenes of distress that imagination increases our sensibility. It gives us a double share in the prosperity of others, and enables us to partake with a more lively interest in every fortunate incident that occurs either to individuals or to communities. Even from the productions of the earth and the vicissitudes of the year, it carries forward our thoughts to the enjoyments they bring to the sensitive creation, and by interesting our benevolent affections in the scenes we behold, lends a new charm to the beauties of nature.

I have often been inclined to think, that the apparent coldness and selfishness of mankind may be traced, in a great measure, to a want of attention and a want of imagination. In the case of misfortunes which happen to ourselves, or to our near connections, neither of these powers is necessary to make us acquainted with our situation: so that we feel, of necessity, the correspondent emotions. But without an uncommon degree of both, it is impossible for any man to comprehend completely the situation of his neighbor, or to have an idea of a great part of the distress which exists in the world. If we feel, therefore, more for ourselves than for others, the difference is to be ascribed, at least partly, to this; that, in the former case, the facts which are the foundation of our feelings, are more fully before us than they possibly can be in the latter.

In order to prevent misapprehensions of my meaning, it is necessary for me to add, that I do not mean to deny that it is a law of our nature, in cases in which there is an interference between our own interest and that of other men, to give a certain degree of preference to ourselves; even supposing our neighbor's situation to be as completely known to us as our own. I only affirm, that, where this preference becomes blamable and unjust, the effect is to be accounted for partly in the way I mentioned.* One striking proof of this is, the powerful emotions which may be occasionally excited in the minds of the most callous, when the attention has been once fixed, and the imagination awakened by eloquent, and circumstantial, and pathetic description.

Adam Smith traces the sense of justice to a regard for the opinion of others. — A very amiable and profound moralist, in the account which he has given of the origin of our sense of justice, has, I think, drawn a less pleasing picture of the natural constitution of the human mind, than is agreeable to truth. "To disturb," says he, "the happiness of our neighbor, merely because it stands in the way of our own; to take from him what is of real use to him, merely because it may be of equal or of more use to us; or, to indulge, in this manner, at the expense of other people, the natural preference which every man has for his own happiness above that of other people, is what no impartial spectator can go along with. Every man is, no doubt, first and principally recommended to his own care; and as he is fitter to take care of himself than of any other person, it is fit and right that it should be so. Every man, therefore, is much more deeply interested in whatever immediately concerns himself, than in what concerns any other man; and to hear, perhaps, of the death of another person with whom we have no particular connection, will give us less concern, will spoil our stomach, or break our rest, much less than a very insignificant disaster which has befallen ourselves. But though the ruin of our neighbor may affect us much less than a very small misfortune of our own, we must not ruin him to prevent that small misfortune, nor even to prevent our own ruin. We must here, as in all other cases, view ourselves not so much according to that light in which we may naturally appear to ourselves, as according to that in which we naturally appear to others. Though every man may, according to the proverb, be the whole world to him self, to the rest of mankind he is a most insignificant part of it

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* I say *partly;* for habits of inattention to the situation of other men, undoubtedly presuppose some defect in the social affections.

Though his own happiness may be of more importance to him than that of all the world besides, to every other person it is of no more consequence than that of any other man. Though it may be true, therefore, that every individual, in his own breast, naturally prefers himself to all mankind, yet he dares not look mankind in the face, and avow that he acts according to this principle. He feels that, in this preference, they can never go along with him, and that, how natural soever it may be to him, it must always appear excessive and extravagant to them. When he views himself in the light in which he is conscious that others will view him, he sees that, to them, he is but one of the multitude, in no respect better than any other in it. If he would act so as that the impartial spectator may enter into the principles of his conduct, which is what of all things he has the greatest desire to do, he must, upon this, as upon all other occasions, humble the arrogance of his self-love, and bring it down to something which other men can go along with."

This theory controverted; benevolent feeling independent of the opinion of others. — I am ready to acknowledge, that there is much truth in this passage; and that a prudential regard to the opinion of others, might teach a man of good sense, without the aid of more amiable motives, to conceal his unreasonable partialities in favor of himself, and to act agreeably to what he conceives to be the sentiments of impartial spectators. But I cannot help thinking, that the fact is much too strongly stated with respect to the natural partiality of self-love, supposing the situation of our neighbors to be as completely presented to our view, as our own must of necessity be. When the orator wishes to combat the selfish passions of his audience, and to rouse them to a sense of what they owe to mankind, what mode of persuasion does nature dictate to him? Is it, to remind them of the importance of the good opinion of the world, and of the necessity, in order to obtain it, of accommodating their conduct to the sentiments of others, rather than to their own feelings? Such considerations undoubtedly might, with some men, produce a certain effect; and might lead them to assume the appearance of virtue; but they would never excite a sentiment of indignation at the thought of injustice, or a sudden and involuntary burst of disinterested affection. If the orator can only succeed in fixing their attention to facts, and in bringing these facts home to their imagination by the power of his eloquence, he has completely attained his object. No sooner are the facts apprehended, than the benevolent principles of our nature display themselves in all their beauty. The most cautious and timid lose, for a moment, all thought of themselves, and despising every consideration of prudence or of safety, become wholly engrossed with the fortunes of others.

Many other facts, which are commonly alleged as proofs of the original selfishness of mankind, may be explained, in part, in a similar way; and may be traced to habits of inattention, or to a want of imagination, arising, probably, from some fault in early education.

What has now been remarked with respect to the social principles, may be applied to all our other passions, excepting those which take their rise from the body. They are commonly strong in proportion to the warmth and vigor of the imagination.

Unexercised imaginations, when once roused, become ungovernable.— It is, however, extremely curious, that when an imagination, which is naturally phlegmatic, or which, like those of the vulgar, has little activity from a want of culture, is fairly roused by the descriptions of the orator or the poet, it is more apt to produce the violence of enthusiasm, than in minds of a superior order. By giving this faculty occasional exercise, we acquire a great degree of command over it. As we can withdraw the attention at pleasure from objects of sense, and transport ourselves into a world of our own, so, when we wish to moderate our enthusiasm, we can dismiss the objects of imagination, and return to our ordinary perceptions and occupations. But in a mind to which these intellectual visions are not familiar, and which borrows them completely from the genius of another, imagination, when once excited, becomes perfectly ungovernable, and produces something like a temporary insanity. Hence the wonderful effects of popular eloquence on the lower orders; effects which are much more remarkable than what it ever produces on men of education.*

V. *Inconveniences resulting from an ill-regulated imagination.* — It was undoubtedly the intention of nature, that the objects of *perception* should produce much stronger impressions on the mind than its own operations. And, accordingly, they always do so, when proper care has been taken in early life to exercise the different principles of our constitution. But it is possible, by long habits of solitary reflection, to reverse this order of things, and to weaken the attention to sensible objects to so great a degree, as to leave the conduct almost wholly under the influence of imagination. Removed to a distance from society, and from the pursuits of life, when we have long been accustomed to converse with our own thoughts, and have found our activity gratified by intellectual exertions, which afford scope to all our powers and affections, without exposing us to the inconveniences resulting from the bustle of the world, we are apt to contract an unnatural predilection for meditation, and to lose all interest in external occurrences. In such a situation, too, the mind gradually loses that command which education, when properly conducted, gives it over the train of its ideas, till at length, the most extravagant dreams of imagination acquire as powerful an influence in exciting all its passions, as if they were realities. A wild and mountainous country, which presents but a limited variety of objects, and these only of such a sort as "awake to solemn thought," has a remarkable effect in cherishing this enthusiasm.

Remedies for a disordered imagination. — When such disorders of the imagination have been long confirmed by habit, the evil may, perhaps, be beyond a remedy; but in their inferior degrees, much may be expected from our own efforts; in particular, from mingling gradually in the business and amusements of the world; or, if we have sufficient force of mind for the exertion, from resolutely plunging into those active and interesting and hazardous scenes, which, by compelling us to attend to external circumstances, may weaken the impressions of imagination, and strengthen those produced by realities. The advice of the poet, in these cases, is equally beautiful and just: —

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* "The province of eloquence is to reign over minds of *slow perception and little imagination;* to set things in lights they never saw them in; to engage their attention by details and circumstances gradually unfolded; to adorn and heighten them with images and colors unknown to them; and to raise and engage their rude passions to the point to which the speaker wishes to bring them." — *Gray's Letters,* p. 394.

> "Go, soft enthusiast! quit the cypress groves,
> Nor to the rivulet's lonely moanings tune
> Your sad complaint. Go, seek the cheerful haunts
> Of men, and mingle with the bustling crowd;
> Lay schemes for wealth, or power, or fame, the wish
> Of nobler minds, and push them night and day.
> Or join the caravan in quest of scenes
> New to your eyes, and shifting every hour,
> Beyond the Alps, beyond the Apennines.
> Or, more adventurous, rush into the field
> Where war grows hot; and raging through the sky,
> The lofty trumpet swells the madd'ning soul;
> And in the hardy camp and toilsome march,
> Forget all softer and less manly cares."
>
> ARMSTRONG.

Connection between genius and melancholy. — The disordered state of mind to which these observations refer, is the more interesting, that it is chiefly incident to men of uncommon sensibility and genius. It has been often remarked, that there is a connection between genius and melancholy; and there is one sense of the word melancholy, in which the remark is undoubtedly true; a sense which it may be difficult to define, but in which it implies nothing either gloomy or malevolent. This, I think, is not only confirmed by facts, but may be inferred from some principles which were formerly stated on the subject of invention; for as the disposition now alluded to has a tendency to retard the current of thought, and to collect the attention of the mind, it is peculiarly favorable to the discovery of those profound conclusions which result from an accurate examination of the less obvious relations among our ideas. From the same principles, too, may be traced some of the effects which situation and early education produce on the intellectual character. Among the natives of wild and solitary countries, we may expect to meet with sublime exertions of poetical imagination and of philosophical research; while those men whose attention has been dissipated from infancy amidst the bustle of the world, and whose current of thought has been trained to yield and accommodate itself, every moment, to the rapid succession of trifles, which diversify fashionable life, acquire, without any effort on their part, the intellectual habits which are favorable to gayety, vivacity, and wit.

Very-imaginative persons may appear almost insane. — When a man, under the habitual influence of a warm imagination, is obliged to mingle occasionally in scenes of real business, he is perpetually in danger of being misled by his own enthusiasm. What we call *good sense* in the conduct of life, consists chiefly in that temper of mind which enables its possessor to view, at all times, with perfect coolness and accuracy, all the various circumstances of his situation, so that each of them may produce its due impression on him, without any exaggeration arising from its own peculiar habits. But to a man of an ill-regulated imagination, external circumstances only serve as hints to excite his own thoughts, and the conduct he pursues has, in general, far less reference to his real situation, than to some imaginary one, in which he conceives himself to be placed; in consequence of which, while he appears to himself to be acting with the most perfect wisdom and consistency, he may frequently exhibit to others all the appearances of folly. Such, pretty nearly, seems to be the idea which the author (Madame de Staël Holstein) of the "Reflections on the Character and Writings of Rousseau," has formed of that extraordinary man. "His faculties," we are told, "were slow in their operation, but his heart was ardent; it was in consequence of his own meditations that he became impassioned; he discovered no sudden emotions, but all his feelings grew upon reflection. It has, perhaps, happened to him to fall in love gradually with a woman, by dwelling on the idea of her during her absence. Sometimes he would part with you with all his former affection; but if an expression had escaped you, which might bear an unfavorable construction, he would recollect it, examine it, exaggerate it, perhaps dwell upon it for a month, and conclude by a total breach with you. Hence it was that there was scarce a possibility of undeceiving him; for the light which broke in upon him at once was not sufficient to efface the wrong impressions which had taken place so gradually in his mind. It was extremely difficult, too, to continue long on an intimate footing with him. A word, a gesture, furnished him with matter of profound meditation; he connected the most trifling circumstances like so many mathematical propositions, and conceived his conclusions to be supported by the evidence of demonstration." "I believe," continues this ingenious writer, "that imagination was the strongest of his faculties, and that it had almost absorbed all the rest. He dreamed rather than existed, and the events of his life might be said, more properly to have passed in his mind, than without him; a mode of being, one should have thought, that ought to have secured him from distrust, as it prevented him from observation; but the truth was, it did not hinder him from attempting to observe; it only rendered his observations erroneous. That his soul was tender, no one can doubt, after having read his works; but his imagination sometimes interposed between his reason and his affections, and destroyed their influence: he appeared sometimes void of sensibility; but it was because he did not perceive objects such as they were. Had he seen them with our eyes, his heart would have been more affected than ours."

In this very striking description, we see the melancholy picture of sensibility and genius approaching to insanity. It is a case, probably, that but rarely occurs in the extent here described; but, I believe, there is no man who has lived much in the world, who will not trace many resembling features to it, in the circle of his own acquaintances; perhaps there are few who have not been occasionally conscious of some resemblance to it in themselves.

Mistakes in judgment resulting from an ill-regulated imagination. — To these observations we may add, that, by an excessive indulgence in the pleasures of imagination, the taste may acquire a fastidious refinement, unsuitable to the present situation of human nature; and those intellectual and moral habits, which ought to be formed by actual experience of the world, may be gradually so accommodated to the dreams of poetry and romance, as to disqualify us for the scene in which we are destined to act. Such a distempered state of the mind is an endless source of error; more particularly when we are placed in those critical situations, in which our conduct determines our future happiness or misery; and which, on account of this extensive influence on human life, form the principal groundwork of fictitious composition. The effect of novels, in misleading the passions of youth, with respect to the most interesting and important of all relations, is one of the many instances of the inconveniences resulting from an ill-regulated imagination.

The passion of love has been in every age the favorite subject of the poets, and has given birth to the finest productions of human genius. These are the natural delight of the young and susceptible, long before the influence of the passions is felt; and from these a romantic mind forms to itself an ideal model of beauty and perfection, and becomes enamored with its own creation. On a heart which has been long accustomed to be thus warmed by the imagination, the excellences of real characters make but a slight impression; and, accordingly, it will be found, that men of a romantic turn, unless when under the influence of violent passions, are seldom attached to a particular object. Where, indeed, such a turn is united with a warmth of temperament, the effects are different; but they are equally fatal to happiness. As the distinctions which exist among real characters are confounded by false and exaggerated conceptions of ideal perfection, the choice is directed to some object by caprice and accident; a slight resemblance is mistaken for an exact coincidence; and the descriptions of the poet and novelist are applied literally to an individual, who perhaps falls short of the common standard of excellence. "I am certain," says the author last quoted, in her account of the character of Rousseau, "that he never formed an attachment which was not founded on caprice. It was illusions alone that could captivate his passions; and it was necessary for him always to accomplish his mistress from his own fancy. I am certain, also," she adds, "that the woman whom he loved the most, and perhaps the only woman whom he loved constantly, was his own *Julie*."

In the case of this particular passion, the effects of a romantic imagination are obvious to the most careless observer; and they have often led moralists to regret, that a temper of mind so dangerous to happiness should have received so much encouragement from some writers of our own age, who might have employed their genius to better purposes. These, however, are not the only effects which such habits of study have on the character. Some others, which are not so apparent at first view, have a tendency, not only to mislead us where our own happiness is at stake, but to defeat the operation of those active principles, which were intended to unite us to society. The manner in which imagination influences the mind, in the instances which I allude to at present, is curious, and deserves a more particular explanation.

On what our capacity of moral improvement is founded. — I shall have occasion afterwards to show,* in treating of our moral powers, that *experience diminishes the influence of passive impressions on the mind, but strengthens our active principles.* A course of debauchery deadens the sense of pleasure, but increases the desire of gratification. An immoderate use of strong liquors destroys the sensibility of the palate, but strengthens the habits of intemperance. The enjoyments we derive from any favorite pursuit gradually decay as we advance in years; and yet we continue to prosecute our favorite pursuits with increasing steadiness and vigor.

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* The following reasoning was suggested to me by a passage in Butler's *Analogy*. "Going over the theory of virtue in one's thoughts, talking well, and drawing fine pictures of it, this is so far from necessarily or certainly conducing to form a habit of it in him who thus employs himself, that it may harden the mind in a contrary course, and render it gradually more insensible, *i. e.* form a habit of insensibility to all moral obligations. For, from our very faculty of habits, passive impressions, by being repeated, grow weaker. Thoughts, by often passing through the mind, are felt less sensibly; being accustomed to danger, begets intrepidity, *i. e.* lessens fear; to distress, lessens the passion of pity; to instances of others' mortality, lessens the sensible apprehension of our own. And from these two observations together, that *practical habits are formed and strengthened by repeated acts;* and that *passive impressions grow weaker by being repeated upon us;* it must follow, that active habits may be gradually forming and strengthening by a course of acting upon such and such motives and excitements, while these motives and excitements themselves are, by proportionable degrees, growing less sensible, *i. e.* are continually less and less sensibly felt, even as the active habits strengthen. And experience confirms this; for active principles, at the very time they are less lively in perception than they were,

On these two laws of our nature is founded our capacity of moral improvement. In proportion as we are accustomed to obey our sense of duty, the influence of the temptations to vice is diminished; while, at the same time, our habit of virtuous conduct is confirmed. How many passive impressions, for instance, must be overcome, before the virtue of beneficence can exert itself uniformly and habitually! How many circumstances are there in the distresses of others, which have a tendency to alienate our hearts from them, and which prompt us to withdraw from the sight of the miserable! The impressions we receive from these are unfavorable to virtue; their force, however, every day diminishes, and it may, perhaps, by perseverance, be

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are found to be, somehow, wrought more thoroughly into the temper and character, and become more effectual in influencing our practice. The three things just mentioned may afford instances of it. Perception of danger is a natural excitement of passive fear and active caution; and by being inured to danger, habits of the latter are gradually wrought, at the same time that the former gradually lessens. Perception of distress in others, is a natural excitement passively to pity, and actively to relieve it; but let a man set himself to attend to, inquire out, and relieve distressed persons, and he cannot but grow less and less sensibly affected with the various miseries of life with which he must become acquainted; when yet, at the same time, benevolence, considered not as a passion, but as a practical principle of action, will strengthen; and whilst he passively compassionates the distressed less, he will acquire a greater aptitude actively to assist and befriend them. So, also, at the same time that the daily instances of men's dying around us, give us daily a less sensible passive feeling or apprehension of our own mortality, such instances greatly contribute to the strengthening a practical regard of it in serious men; *i. e.* to forming a habit of acting with a constant view to it."

wholly destroyed. It is thus that the character of the beneficent man is formed. The passive impressions which he felt originally, and which counteracted his sense of duty, have lost their influence, and a habit of beneficence is become part of his nature.

Habits of benevolence make up for the loss of quick sympathies. — It must be owned, that this reasoning may, in part, be retorted; for among those passive impressions, which are weakened by repetition, there are some which have a beneficial tendency. The uneasiness, in particular, which the sight of distress occasions, is a strong incentive to acts of humanity; and it cannot be denied that it is lessened by experience. This might naturally lead us to expect, that the young and unpractised would be more disposed to perform beneficent actions, than those who are advanced in life, and who have been familiar with scenes of misery. And, in truth, the fact would be so, were it not that the effect of custom on this passive impression is counteracted by its effects on others; and, above all, by its influence in strengthening the active habit of beneficence. An old and experienced physician is less affected by the sight of bodily pain than a young practitioner; but he has acquired a more confirmed habit of assisting the sick and helpless, and would offer greater violence to his nature, if he should withhold from them any relief that he has in his power to bestow. In this case we see a beautiful provision made for our moral improvement, as the effects of experience on one part of our constitution are made to counteract its effects on another.

Familiarity with scenes of fictitious distress is hurtful. — If the foregoing observations be well founded, it will follow, that habits of virtue are not to be formed in retirement, but by mingling in the scenes of active life, and that an habitual attention to exhibitions of fictitious distress, is not merely useless to the character, but positively hurtful.

It will not, I think, be disputed, that the frequent perusal of pathetic compositions diminishes the uneasiness which they are naturally fitted to excite. A person who indulges habitually in such studies, may feel a growing desire of his usual gratification, but he is every day less and less affected by the scenes which are presented to him. I believe it would be difficult to find an actor long hackneyed on the stage, who is capable of being completely interested by the distresses of a tragedy. The effect of such compositions and representations, in rendering the mind callous to actual distress, is still greater; for as the imagination of the poet almost always carries him beyond truth and nature, a familiarity with the tragic scenes which he exhibits, can hardly fail to deaden the impression produced by the comparatively trifling sufferings which the ordinary course of human affairs presents to us. In real life, a provision is made for this gradual decay of sensibility, by the proportional decay of other passive impressions, which have an opposite tendency, and by the additional force which our active habits are daily acquiring. Exhibitions of fictitious distress, while they produce the former change on the character, have no influence in producing the latter; on the contrary, they tend to strengthen those passive impressions which counteract beneficence. The scenes into which the novelist introduces us are, in general, perfectly unlike those which occur in the world. As his object is to please, he removes from his descriptions every circumstance which is disgusting, and presents us with the histories of elegant and dignified distress. It is not such scenes that human life exhibits. We have to act, not with refined and elevated characters, but with the mean, the illiterate, the vulgar, and the profligate. *The perusal of fictitious history has a tendency* to increase that disgust which we naturally feel at the concomitants of distress, and *to cultivate a false refinement of taste,* inconsistent with our condition as members of society. Nay, it is possible for this refinement to be carried so far as to withdraw a man from the duties of life, and even from the sight of those distresses which he might alleviate. And, accordingly, many are to be found, who, if the situations of romance were realized, would not fail to display the virtues of their favorite characters, whose sense of duty is not sufficiently strong to engage them in the humble and private scenes of human misery.

To these effects of *fictitious history* we may add, that it *gives* *no exercise to our active habits.* In real life, we proceed from the passive impression to those exertions which it was intended to produce. In the contemplation of imaginary sufferings, we stop short at the impression, and whatever benevolent dispositions we may feel, we have no opportunity of carrying them into action.

Good and evil effects of fiction. — From these reasonings it appears, that an habitual attention to exhibitions of fictitious distress is, in every view, calculated to check our moral improvement. It diminishes that uneasiness which we feel at the sight of distress, and which prompts us to relieve it. It strengthens that disgust which the loathsome concomitants of distress excite in the mind, and which prompts us to avoid the sight of misery; while, at the same time, it has no tendency to confirm those habits of active beneficence, without which, the best dispositions are useless. I would not, however, be understood to disapprove entirely of fictitious narratives, or of pathetic compositions. On the contrary, I think that the perusal of them may be attended with advantage, when the effects which I have mentioned are corrected by habits of real business. They soothe the mind when ruffled by the rude intercourse of society, and stealing the attention insensibly from our own cares, substitute, instead of discontent and distress, a tender and pleasing melancholy. By exhibitions of characters a little elevated above the common standard, they have a tendency to cultivate the taste in life; to quicken our disgust at what is mean or offensive, and to form the mind insensibly to elegance and dignity. Their tendency to cultivate the powers of moral perception has never been disputed; and when the influence of such perceptions is powerfully felt, and is united with an active and manly temper, they render the character not only more amiable, but more happy in itself, and more useful to others; for although a rectitude of judgment with respect to conduct, and strong moral feelings, do, by no means, alone constitute virtue; yet they are frequently necessary to direct our behaviour in the more critical situations of life; and they increase the interest we take in the general prosperity of virtue in the world. I believe, likewise, that, by means of fictitious history, displays of character may be most successfully given, and the various weaknesses of the heart exposed. I only mean to insinuate, that a taste for them may be carried too far; that the sensibility which terminates in imagination, is but a refined and selfish luxury; and that nothing can effectually advance our moral improvement, but an attention to the active duties which belong to our stations.*

VI. *Important uses to which the power of imagination is subservient.* — The faculty of imagination is the great spring of human activity, and the principal source of human improvement. As it delights in presenting to the mind scenes and characters more perfect than those which we are acquainted with, it prevents us from ever being completely satisfied with our present condition, or with our past attainments; and engages us continually in the pursuit of some untried enjoyment, or of some ideal excellence. Hence the ardor of the selfish to better their fortunes, and to add to their personal accomplishments; and hence the zeal of the patriot and the philosopher to advance the virtue and the happiness of the human race. Destroy this faculty, and the condition of man will become as stationary as that of the brutes.

When the notions of enjoyment or of excellence which imagination has formed, are greatly raised above the ordinary standard, they interest the passions too deeply to leave us at all times the cool exercise of reason, and produce that state of the mind which is commonly known by the name of enthusiasm; a temper which is one of the most fruitful sources of error and disappointment; but which is a source, at the same time, of heroic actions and of exalted characters. To the exaggerated conceptions of eloquence which perpetually revolved in the mind of Cicero; to that idea which haunted his thoughts of *aliquid immensum infinitumque*, we are indebted for some of the most splendid displays of human genius; and it is probable that something of the same kind has been felt by every man who has risen much above the level of humanity, either in speculation or in action. It is happy for the individual, when these enthusiastic desires are directed to events which do not depend on the caprice of fortune.

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* After all the concessions I have here made in favor of such fictitious histories as our modern novels, I must acknowledge my own partiality for those performances of an earlier date, which describe *the adventures of imaginary orders of being.* [The Arabian Nights' Entertainment, Fairy Tales, etc.] Many of them afford lessons of morality not less instructive than those in our most unexceptionable novels; and they possess, over and above, the important advantage of giving to the imagination of young persons a much more vigorous exercise, while they have no such tendency as novels have to mislead them in their views of human life. In most cases, it may be laid down as a rule, that fictitious histories are dangerous, in proportion as the manners they exhibit profess to approach to those which we expect to meet with in the world.

Why the higher kinds of poetry please. — The pleasure we receive from the higher kinds of poetry takes rise, in part, from that dissatisfaction which the objects of imagination inspire us with, for the scenes, the events, and the characters, with which our senses are conversant. Tired and disgusted with this world of imperfection, we delight to escape to another of the poet's creation, where the charms of nature wear an eternal bloom, and where sources of enjoyment are opened to us, suited to the vast capacities of the human mind.* On this natural love of poetical fiction, Lord Bacon has founded a very ingenious argument for the soul's immortality; and, indeed, one of the most important purposes to which it is subservient, is to elevate the mind above the pursuits of our present condition, and to direct the views to higher objects. In the mean time, it is rendered subservient also, in an eminent degree, to the improvement and happiness of mankind, by the tendency which it has to accelerate the progress of society.

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* [Poetry, says Lord Bacon, "is nothing else but feigned history, which may be styled [written] as well in prose as in verse. The use of this feigned history hath been, to give some shadow of satisfaction to the mind of man in those points wherein the nature of things doth deny it, the world being in proportion inferior to the soul; by reason whereof, there is agreeable to the spirit of man a more ample greatness, a more exact goodness, and a more absolute variety, than can be found in the nature of things. Therefore, because the acts or events of true history have not that magnitude which satisfieth the mind of man, poesy feigneth acts and events greater and more heroical: because true history propoundeth the successes and issues of actions not so agreeable to the merits of virtue and vice,

Good effects of a taste for poetry. — As the pictures which the poet presents to us are never (even in works of pure description) faithful copies from nature, but are always meant to be improvements on the original she affords, it cannot be doubted that they must have some effect in refining and exalting our taste, both with respect to material beauty, and to the objects of our pursuit in life. It has been alleged, that the works of our descriptive poets have contributed to diffuse that taste for picturesque beauty which is so prevalent in England, and to recall the public admiration from the fantastic decorations of art, to the more powerful and permanent charms of cultivated nature; and it is certain, that the first ardors of many an illustrious character have been kindled by the compositions of Homer and Virgil. It is difficult to say, to what a degree, in the earlier periods of society, the rude compositions of the bard and the minstrel may have been instrumental in humanizing the minds of savage warriors, and in accelerating the growth of cultivated manners. Among the Scandinavians and the Celtæ, we know that this order of men was held in very peculiar veneration; and, accordingly, it would appear, from the monuments which remain of these nations, that they were distinguished by a delicacy in the passion of love, and by a humanity and generos-

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therefore poesy feigneth them more just in retribution, and more according to revealed providence: because true history representeth actions and events more ordinary, and less interchanged, therefore poesy endueth them with more rareness, and more unexpected and alternative variations: so as it appeareth, poesy serveth and conferreth to magnanimity, morality, and to delectation. And therefore it was ever thought to have some participation of divineness, because it doth raise and erect the mind, by submitting the shows of things to the desires of the mind; whereas reason doth buckle and bow the mind unto the nature of things. And we see, that by these insinuations and congruities with man's nature and pleasure, joined also with the agreement and consort it hath with music, it hath had access and estimation in rude times and barbarous regions, where other learning stood excluded."] — *Advancement of Learning.* Book ii.

ity to the vanquished in war, which seldom appear among barbarous tribes; and with which it is hardly possible to conceive how men in such a state of society could have been inspired, but by a separate class of individuals in the community, who devoted themselves to the pacific profession of poetry, and to the cultivation of that creative power of the mind, which anticipates the course of human affairs, and presents, in prophetic vision, to the poet and the philosopher, the blessings which accompany the progress of reason and refinement.

Imagination multiplies our innocent enjoyments. — Nor must we omit to mention the important effects of imagination, in multiplying the sources of innocent enjoyment beyond what this limited scene affords. Not to insist on the noble efforts of genius, which have rendered this part of our constitution subservient to moral improvement, how much has the sphere of our happiness been extended, by those agreeable fictions which introduce us to new worlds, and make us acquainted with new orders of being! What a fund of amusement, through life, is prepared for one who reads in his childhood the fables of ancient Greece! They dwell habitually on the memory, and are ready, at all times, to fill up the intervals of business, or of serious reflection; and in his hours of rural retirement and leisure, they warm his mind with the fire of ancient genius, and animate every scene he enters, with the offspring of classical fancy.

Happy effect of agreeable anticipations of the future. — It is, however, chiefly in painting future scenes, that imagination loves to indulge herself, and her prophetic dreams are almost always favorable to happiness. By an erroneous education, indeed, it is possible to render this faculty an instrument of constant and of exquisite distress; but, in such cases, (abstracting from the influence of a constitutional melancholy,) the distresses of a gloomy imagination are to be ascribed, not to nature, but to the force of early impressions.

The common bias of the mind undoubtedly is, (such is the benevolent appointment of Providence,) to think favorably of the future; to overvalue the chances of possible good, and to underrate the risk of possible evil; and, in the case of some fortunate individuals, this disposition remains after a thousand disappointments. To what this bias of our nature is owing, it is not material for us to inquire; the fact is certain, and it is an important one to our happiness. It supports us under the real distresses of life, and cheers and animates all our labors; and although it is sometimes apt to produce, in a weak and indolent mind, those deceitful suggestions of ambition and vanity, which lead us to sacrifice the duties and the comforts of the present moment to romantic hopes and expectations; yet, it must be acknowledged, when connected with habits of activity, and regulated by a solid judgment, to have a favorable effect on the character, by inspiring that ardor and enthusiasm which both prompt to great enterprises, and are necessary to insure their success. When such a temper is united (as it commonly is) with pleasing notions concerning the order of the universe, and, in particular, concerning the condition and the prospects of man, it places our happiness, in a great measure, beyond the power of fortune. While it adds a double relish to every enjoyment, it blunts the edge of all our sufferings; and, even when human life presents to us no object on which our hopes can rest, it invites the imagination beyond the dark and troubled horizon, which terminates all our earthly prospects, to wander unconfined in the regions of futurity. A man of benevolence, whose mind is enlarged by philosophy, will indulge the same agreeable anticipations with respect to society; will view all the different improvements in arts, in commerce, and in the sciences, as coöperating to promote the union, the happiness, and the virtue of mankind; and amidst the political disorders resulting from the prejudices and follies of his own times, will look forward with transport to the blessings which are reserved for posterity in a more enlightened age.

CHAPTER VIII

OF REASON.

I. *On the vagueness and ambiguity of the common philosophical language relative to this part of our constitution.* — The power of Reason, of which I am now to treat, is unquestionably the most important by far of those which are comprehended under the general title of intellectual. It is on the right use of this power, that our success in the pursuit both of knowledge and of happiness depends; and it is by the exclusive possession of it, that man is distinguished, in the most essential respects, from the lower animals. It is, indeed, from their subserviency to its operations, that the other faculties, which have been hitherto under our consideration, derive their chief value.

Popular meaning of the word Reason. — Some remarkable instances of vagueness and ambiguity in the employment of words, occur in that branch of my subject of which I am now to treat. The word *Reason*, itself, is far from being precise in its meaning. In common and popular discourse, it denotes *that power by which we distinguish truth from falsehood, and right from wrong; and by which we are enabled to combine means for the attainment of particular ends.* Whether these different capacities are, with strict logical propriety, referred to the same power, is a question which I shall examine in another part of my work; but that they are all included in the idea which is generally annexed to the word *Reason*, there can be no doubt; and the case, so far as I know, is the same with the corresponding term in all languages whatever. The fact probably is, that this word was *first employed* to comprehend *the principles*, whatever they are, *by which man is distinguished from the brutes;* and afterwards came to be somewhat limited in its meaning, by the more obvious conclusions concerning the nature of that distinction, which present themselves to the common sense of mankind. It is in this enlarged meaning that it is opposed to instinct by Pope:—

> "And reason raise o'er instinct as you can;
> In this 'tis God directs, in that 'tis man."

It was thus, too, that Milton plainly understood the term, when he remarked, that smiles imply the exercise of Reason:—

> ——— "Smiles from Reason flow,
> To brutes denied:"

and still more explicitly in these noble lines:—

> "There wanted yet the master-work, the end
> Of all yet done; a creature who, not prone
> And brute as other creatures, but endued
> With sanctity of Reason, might erect
> His stature, and upright with front serene
> Govern the rest, self-knowing; and from thence,
> Magnanimous, to correspond with heaven;
> But, grateful to acknowledge whence his good
> Descends, thither with heart, and voice, and eyes,
> Directed in devotion, to adore
> And worship God Supreme, who made him chief
> Of all his works."

Among the various characteristics of humanity, the power of devising means to accomplish ends, together with the power of distinguishing truth from falsehood, and right from wrong, are obviously the most conspicuous and important; and accordingly it is to these that the word Reason, even in its most comprehensive acceptation, is now exclusively restricted.*

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* This, I think, is the meaning which most naturally presents itself to common readers, when the word *Reason* occurs in authors not affecting to aim at any nice logical distinctions; and it is certainly the meaning which must be annexed to it, in some of the most serious and important arguments in which it has ever been employed. In the following passage, for example, where Mr. Locke contrasts the light of Reason with that of Revelation, he plainly proceeds on the supposition, that it is competent to appeal to the former, as affording a standard of *right and wrong*, not less

More limited meaning of the word. — By some philosophers, the meaning of the word has been of late restricted still further; to *the power by which we distinguish truth from falsehood, and combine means for the accomplishment of our purposes;* — the capacity of distinguishing right and wrong being referred to a separate principle or faculty, to which different names have been assigned in different ethical theories. The following passage from Mr. Hume contains one of the most explicit statements of this limitation which I can recollect: "Thus the distinct boundaries and offices of *reason* and of *taste* are easily ascertained. *The former* conveys the knowledge of truth and falsehood; *the latter* gives the sentiment of beauty and deformity, — vice and virtue. *Reason,* being cool and disengaged, is no motive to action, and directs only the impulse received from appetite or inclination, by showing us the means of attaining happiness or avoiding misery. *Taste,* as it gives pleasure or pain, and thereby constitutes happiness or misery, becomes a motive to action, and is the first spring or impulse to desire and volition."

Reason distinguished from reasoning. — Another ambiguity in the word *Reason,* it is of still greater consequence to point out at present; an ambiguity which leads us to confound our rational powers in general, with that particular branch of them known among logicians by the name of *the discursive faculty.* The affinity between the words *reason* and *reasoning* sufficiently accounts for this inaccuracy in common and popular language;

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than of *speculative truth and falsehood;* nor can there be a doubt that, when he speaks of *truth* as the object of natural Reason, it was principally, if not wholly, *moral truth,* which he had in his view; "Reason is natural revelation, whereby the eternal Father of Light, and fountain of all knowledge, communicates to mankind that portion of truth which he has laid within the reach of their natural faculties. Revelation is natural reason, enlarged by a new set of discoveries, communicated by God immediately, which reason vouches the truth of, by the testimony and proofs it gives that they come from God. So that he who takes away reason to make way for revelation, puts out the light of both, and does much the same as if he would persuade a man to put out his eyes, the better to receive the remote light of an invisible star by a telescope."

although it cannot fail to appear obvious, on the slightest reflection, that, in strict propriety, *reasoning only expresses one of the various functions or operations of Reason;* and that an extraordinary capacity for the former by no means affords a test, by which the other constituent elements of the latter may be measured." * Nor is it to common and popular language that this inaccuracy is confined. It has extended itself to the systems of some of our most acute philosophers, and has, in various instances, produced an apparent diversity of opinion, where there was little or none in reality.

In the use which I make of the word *Reason*, in the title of the following disquisitions, I employ it in a manner to which no philosopher can object, — to denote *merely the power by which we distinguish truth from falsehood, and combine means for the attainment of our ends;* omitting, for the present, all consideration of that function which many have ascribed to it, of distinguishing right from wrong; without, however, presuming to call in question the accuracy of those by whom the term has been thus explained. Under the title of *Reason*, I shall consider also whatever faculties and operations appear to be more immediately and essentially connected with the discovery of truth, or the attainment of the objects of our pursuit, — more particularly the power of *reasoning or deduction;* but distinguishing, as carefully as I can, our capacity of carrying on this logical process, from those more comprehensive powers which Reason is understood to imply.*

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* "The two most different things in the world," says Locke, "are, a logical chicaner, and a man of reason." The adjective *reasonable*, as employed in our language, is not liable to the same ambiguity with the substantive from which it is derived. It denotes a character in which *Reason*, (taking that word in its largest acceptation,) *possesses a decided ascendant over the temper and the passions;* and implies no particular propensity to a display of the discursive power, if, indeed, it does not exclude the idea of such a propensity. In the following stanza, Pope certainly had no view to the *logical* talents of the lady whom he celebrates: —

"I know a thing that's most uncommon,
(Envy, be silent and attend!)
I know a reasonable woman,
Handsome and witty, yet a friend."

Various meanings of the word Understanding.—Another instance of the vagueness and indistinctness of the common language of logicians, in treating of this part of the Philosophy of the Human Mind, occurs in the word *Understanding.* In its popular sense, it seems to be very nearly synonymous with

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* [Kant, and the later German metaphysicians, together with some of the French school, assign very different functions to the *Reason* and the *Understanding.* Indeed, the distinction between these two faculties is the key-note of German transcendental philosophy. According to Kant, *Reason* is the faculty which evolves our *ideas* of all that transcends the sphere of the senses and the limitations of experience,—of all which is not subject to the conditions of space and time, but is infinite and absolute. In one word, Reason is the faculty of the Unconditioned; it is the soul itself, in the highest exercise of its activity, forming for itself *ideas,* to which there are no corresponding realities in the world of sense or in the cognitions of the understanding. "Reason," says Krug, one of the ablest expounders of the Kantian philosophy, "is the noblest jewel of humanity, the true image of God, whereby alone man can raise himself from one stage of perfection to another. It rests, therefore, upon the perfectibility of our race, so that we are always striving after the Ideal, without ever obtaining it in all its fulness. Consequently, Reason is the only characteristic which distinguishes man from the other beasts of the earth; these resemble him more or less in all other respects, they even surpass him in some, but show no trace of Reason, because they neither strive after the Ideal, nor are they able to perfect themselves by their own power." But it must be remembered, that no *knowledge,* properly so called, can be constructed out of these Ideas which are evolved by Reason, since there is no object corresponding to them in the whole circle of experience. The Reason ceaselessly strives after a knowledge of God, of the Universe, of the Immortality and Freedom of the Soul; and from these vain efforts, constantly renewed and constantly defeated, have arisen all the doctrines and systems of metaphysics. We cannot either prove or disprove the reality of the supersensual objects corresponding to these *ideas* of the Reason. The arguments for and against any conclusion respecting them are equally valid, and thus confute each other. Thus Kant is led to affirm, that no metaphysical science is possible, and that the doctrines of ontology and speculative theology are self-contradictory and absurd.

This account of the Reason coincides very nearly with a doctrine attributed by Cudworth to the ancient philosophers, when he says, "We have all of us, by nature, μαντευμά τι (as both Plato and Aristotle call it), a cer-

Reason, when that word is used most comprehensively; and is seldom or never applied to any of our faculties, but such as are immediately subservient to the investigation of truth, or to the regulation of our conduct. In this sense, it is so far from being understood to comprehend the powers of imagination, fancy, and wit, that it is often stated in direct opposition to them; as in the common maxim, that a sound understanding and a warm

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tain divination, presage, and parturient vaticination in our minds, of some higher good and perfection than either power or knowledge. Knowledge is plainly to be preferred before power, as being that which guides and directs its blind force and impetus; but Aristotle himself declares, that there is *λόγου τι κρεῖττον*, which is *λόγου ἀρχὴ*, something better than reason and knowledge, which is the principle and original of all. For (saith he) *λόγου ἀρχὴ οὐ λόγος, ἀλλά τι κρεῖττον*; the principle of reason is not reason, but something better." — Cudworth's *Intellectual System*, Am. ed. vol. 1, p. 277.

The *Understanding*, on the other hand, according to Kant, is a lower faculty of the mind, which corresponds very nearly to what we call understanding, or *intellect*. It is that faculty of the mind, by which the individual representations that come to us through the senses, are formed into general *conceptions* and *judgments*, so as to become food for *thought*. The *intuitions of sence*, as they are termed, are thus formed into *conceptions*, by being subsumed under the *categories* of the Understanding. An intuition is thus subsumed under the categories of *quantity*, for instance, by being necessarily conceived of as *one*, *many*, or *all*; under the categories of *quality*, because we must think of it as *real*, *unreal*, or *limited*, &c. These categories are *forms* of the Understanding; they are not received from experience, but are conditions imposed upon experience, as, without them, experience would not be possible. The Understanding is like a colored glass, which imposes its own hues upon all external objects. We cannot see *things as they are in themselves*, but only as they appear to us, under the forms and conditions of the intellect; we cannot know them as *noumena*, but can only recognize them as *phenomena*.

Kant's system is certainly obscure, but it is by no means unintelligible. From the faint and imperfect outline of it which is here given, and which is designed only as an explanation of some of its technical terms, it is easy to see, that it is a system of skepticism far more comprehensive than that of Hume. It denies the possibility of our knowing any thing which lies beyond the limits of the senses and experience; and even within these limits, we can know things, not as they really are, but only as they appear to us.]

imagination are seldom united in the same person. But philosophers, without rejecting this use of the word, very generally employ it, with far greater latitude, to comprehend all the powers which I have enumerated under the title of *intellectual;* referring to it imagination, memory, and perception, as well as the faculties to which it is appropriated in popular discourse, and which it seems, indeed, most properly to denote. It is in this manner that it is used by Mr. Locke, in his celebrated Essay; and by all the logicians, who follow the common division of our mental powers into those of the understanding and those of the will.

As the word *understanding*, however, is one of those which occur very frequently in philosophical arguments, it may be of some use to disengage it from the ambiguity just remarked; and it is on this account, that I have followed the example of some late writers, in distinguishing the two classes of powers, which were formerly referred to the *understanding* and to the *will*, by calling the former *intellectual*, and the latter *active*.* The terms *cognitive* and *motive*, were long ago proposed for the same purpose by Hobbes; but they never appear to have come into general use, and are, indeed, liable to obvious objections.

Ambiguity of the word judgment. — The only other indefinite word, which I shall take notice of in these introductory remarks, is *judgment;* and, in doing so, I shall confine myself to such of its ambiguities as are more peculiarly connected with our present subject. In some cases, its meaning seems to approach to that of *understanding;* as in the nearly synonymous phrases, a sound understanding, and a sound judgment. If there be any difference between these two modes of expression, it appears to me to consist chiefly in this, that the former implies a greater degree of positive ability than the latter; which indicates rather an exemption from those biases which lead the mind astray, than the possession of any uncommon reach of capacity. To *understanding*, we apply the epithets strong, vigorous, comprehensive, profound: to *judgment*, those of correct, cool, unprejudiced, impartial, solid. It was in this sense, that the word seems to have been understood by Pope, in the following couplet:—

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* [See note to page 14.]

> "'Tis with our judgments as our watches; none
> Go just alike, yet each believes his own."

For this meaning of the word, its primitive and literal application to the judicial decision of a tribunal accounts sufficiently.

Agreeably to the same fundamental idea, the name of *judgment* is given with peculiar propriety to those acquired powers of discernment, which characterize a skilful critic in the fine arts; powers which depend, in a very great degree, on a temper of mind free from the undue influence of authority and of casual associations. The power of *taste* itself is frequently denoted by the appellation of *judgment;* and a person who possesses a more than ordinary share of it, is said to be a *judge* in those matters which fall under its cognizance.

In treatises of logic, *judgment* is commonly defined to be *an act of the mind, by which one thing is affirmed or denied of another;* a definition which, though not unexceptionable, is, perhaps, less so than most that have been given on similar occasions. Its defect, as Dr. Reid has remarked, consists in this,—that although it be by affirmation or denial that we express our judgments to others, yet judgment is a solitary act of the mind, to which this affirmation or denial is not essential; and, therefore, if the definition be admitted, it must be understood of *mental* affirmation or denial only; in which case, we do no more than substitute, instead of the thing defined, another mode of speaking, perfectly synonymous. The definition has, however, notwithstanding this imperfection, the merit of a conciseness and perspicuity, not often to be found in the attempts of logicians to explain our intellectual operations.

Obscurity in metaphysics is always the fault of the writer.—To the following observations of D'Alembert, (with some trifling verbal exceptions,) I give my most cordial assent; and, mortifying as they may appear to the pretensions of bolder theorists, I should be happy to see them generally recognized as canons of philosophical criticism: "Truth in metaphysics resembles truth in matters of taste. In both cases, the seeds of it exist in every mind; though few think of attending to this latent treasure, till it be pointed out to them by more curious inquirers. It should seem, that every thing we learn from a good metaphysical book, is only a sort of reminiscence of what the mind previously knew. The obscurity of which we are apt to complain in this science, may be always justly ascribed to the author; because the information which he professes to communicate, requires no technical language appropriated to itself. Accordingly, we may apply to good metaphysical authors, what has been said of those who excel in the art of writing, that, in reading them, everybody is apt to imagine, that he himself could have written in the same manner.

"But, in this sort of speculation, if all are qualified to understand, all are not fitted to teach. The merit of accommodating easily to the apprehension of others, notions which are at once simple and just, appears, from its extreme rarity, to be much greater than is commonly imagined. Sound metaphysical principles, are truths which every one is ready to seize, but which few men have the talent of unfolding; so difficult is it in this, as well as in other instances, to appropriate to one's self, what seems to be the common inheritance of the human race."

I begin with a review of some of those primary truths, a conviction of which is necessarily implied in all our thoughts, and in all our actions; and which seem, on that account, rather to form constituent and essential elements of reason, than objects with which reason is conversant. The import of this last remark will appear more clearly afterwards.

The primary truths to which I mean to confine my attention at present are, 1. Mathematical *axioms;* 2. *Truths,* (or more properly speaking, *laws of belief,*) inseparably connected with the exercise of consciousness, perception, memory, and reasoning.

I. *Of Mathematical Axioms.* — I have placed this class of truths at the head of the enumeration, merely because they seem likely, from the place which they hold in the elements of geometry, to present to my readers a more interesting, and at the same time an easier, subject of discussion, than some of the more abstract and latent elements of our knowledge, afterwards to be considered. In other respects, a different arrangement might perhaps have possessed some advantages, in point of strict logical method.

Axioms are not principles from which any knowledge can be deduced. — It was long ago remarked by Locke, of the axioms of geometry, as stated by Euclid, that, although the proposition be at first enunciated in general terms, and afterwards appealed to, in its particular applications, as a principle previously examined and admitted, yet that the truth is not less evident in the latter case than in the former. He observes further, that it is in some of its particular applications, that the truth of every axiom is originally perceived by the mind; and, therefore, that the general proposition, so far from being the ground of our assent to the truths which it comprehends, is only a verbal generalization of what, in particular instances, has been already acknowledged as true.

The same author remarks, that some of these axioms "are no more than bare verbal propositions, and teach us nothing but the respect and import of names one to another. 'The whole is equal to all its parts'; what real truth, I beseech you, does it teach us? What more is contained in that maxim, than what the signification of the word *totum*, or the whole, does of itself import? And he that knows that the word *whole* stands for what is made up of all its parts, knows very little less, than that "the whole is equal to all its parts." And upon the same ground, I think that this proposition, 'A hill is higher than a valley,' and several the like, may also pass for maxims."

How far axioms are useful. — Notwithstanding these considerations, Mr. Locke does not object to the form which Euclid has given to his axioms, or to the place which he has assigned to them in his Elements. On the contrary, he is of opinion, that a collection of such maxims is not without reason prefixed to a mathematical system; in order that learners, "having in the beginning perfectly acquainted their thoughts with these propositions made in general terms, may have them ready to apply to all particular cases, as formed rules and sayings. Not that, if they be equally weighed, they are more clear and evident than the instances they are brought to confirm; but that, being more familiar to the mind, the very naming of them is enough to satisfy the understanding." In further illustration of this, he adds, very justly and ingeniously, that "although our knowledge begins in particulars, and so spreads itself, by degrees, to generals; yet, afterwards, the mind takes quite the contrary course, and having drawn its knowledge into as general propositions as it can, makes them familiar to its thoughts, and accustoms itself to have recourse to them, as to the standards of truth and falsehood."

But although in mathematics some advantage may be gained, without the risk of any possible inconvenience, from this arrangement of axioms, it is a very dangerous example to be followed in other branches of knowledge, where our notions are not equally clear and precise; and where the force of our pretended axioms, (to use Mr. Locke's words,) "reaching only to the sound, and not to the signification, of the words, serves only to lead us into confusion, mistakes, and error." For the illustration of this remark, I must refer to Locke.

Axioms are not the foundations on which science rests.— Another observation of this profound writer deserves our attention, while examining the nature of axioms; "that they are not the foundations on which any of the sciences is built; nor at all useful in helping men forward to the discovery of unknown truths." This observation I intend to illustrate afterwards, in treating of the futility of the syllogistic art. At present, I shall only add to what Mr. Locke has so well stated, that, even in mathematics, it cannot with any propriety be said, that the axioms are the foundation on which the science rests, or the first principles from which its more recondite truths are deduced.

"Of intuitive evidence," says Dr. Campbell, "that of the following propositions may serve as an illustration: 'One and four make five.' 'Things equal to the same thing, are equal to one another.' 'The whole is greater than a part;' and, in brief, all axioms in arithmetic and geometry. These are, in effect, but so many expositions of our own general notions, taken in different views. Some of them are no more than definitions, or equivalent to definitions. To say, one and four make five, is precisely the same thing as to say, we give the name of five to one added to four. In fact, they are all, in some respects, reducible to this axiom, 'whatever is, is.' *I do not say they are deduced from it*, for they have, in like manner, that original and intrinsic evidence which makes them, as soon as the terms are understood, to be perceived intuitively. And, if they are not thus perceived, no deduction of reason will ever confer on them any additional evidence. Nay, in point of time, *the discovery of the less general truths has the priority*, not from their superior evidence, but solely from this consideration, that the less general are sooner objects of perception to us. But I affirm, that *though not deduced from that axiom, they may be considered as particular exemplifications of it*, and coincident with it, inasmuch as they are all implied in this, that the properties of our clear and adequate ideas, can be no other than what the mind clearly perceives them to be.

"Now, it is by the aid of such simple and elementary principles, that the arithmetician and algebraist proceed to the most astonishing discoveries. Nor are the operations of the geometrician essentially different."

The nature of mathematical investigations.—I have little to object to these observations of Dr. Campbell, as far as they relate to arithmetic and to algebra; for, in these sciences, all our investigations amount to nothing more than to a comparison of different expressions of the same thing. Our common language indeed frequently supposes the case to be otherwise; as when an equation is defined to be, "A proposition asserting the equality of two quantities." It would, however, be much more correct to define it, "A proposition asserting *the equivalence of two expressions* of the same quantity;" for algebra is merely a universal arithmetic; and the names of numbers are nothing else than collectives, by which we are enabled to express ourselves more concisely than could be done by enumerating all the units that they contain. Of this doctrine, the passage now quoted from Dr. Campbell shows that he entertained a sufficiently just and precise idea.

But, if Dr. Campbell perceived that arithmetical equations, such as "one and four make five," are no other than definitions, why should he have classed them with the axioms he quotes from Euclid, "That the whole is greater than a part," and that "Things equal to the same thing are equal to one another?"—propositions which, however clearly their truth be implied in the meaning of the terms of which they consist, cannot certainly, by any interpretation, be considered in the light of definitions at all analogous to the former. The former, indeed, are only explanations of the relative import of particular names; the latter are universal propositions, applicable alike to an infinite variety of instances.

Another very obvious consideration might have satisfied Dr. Campbell, that the simple arithmetical equations which he mentions, do not hold the same place in that science which Euclid's axioms hold in geometry. What I allude to is, that the greater part of these axioms are equally essential to all the different branches of mathematics. That "the whole is greater than a part," and that "things equal to the same thing are equal to one another," are propositions as essentially connected with our arithmetical computations, as with our geometrical reasonings; and therefore, to explain in what manner the mind makes a transition, in the case of numbers, from the more simple to the more complicated equations, throws no light whatever on the question, how the transition is made, either in arithmetic or in geometry, from what are properly called *axioms*, to the more remote conclusions in these sciences.

The very fruitless attempt thus made by this acute writer to illustrate the importance of axioms as the basis of mathematical truth, was probably suggested to him by a doctrine which has been repeatedly inculcated of late, concerning the grounds of that peculiar evidence which is allowed to accompany mathematical demonstration. "All the sciences," it has been said, "rest ultimately on first principles, which we must take for granted without proof; and whose evidence determines, both in kind and degree, the evidence which it is possible to attain in our conclusions. In some of the sciences, our first principles are intuitively certain; in others, they are intuitively probable; and such as the evidence of these principles is, such must that of our conclusions be. If our first principles are intuitively certain, and if we reason from them consequentially, our conclusions will be demonstratively certain; but if our principles be only intuitively probable, our conclusions will be only demonstratively probable. In mathematics, the first principles from which we reason are a set of axioms, which are not only intuitively certain, but of which we find it impossible to conceive the contraries to be true; and hence the peculiar evidence which belongs to all the conclusions that follow from these principles as necessary consequences."

Definitions, not axioms, are the first principles of mathematics. — That there is something fundamentally erroneous in these very strong statements with respect to the relation which Euclid's axioms bear to the geometrical theorems which follow, appears sufficiently from a consideration which was long ago mentioned by Locke, that from these axioms it is not possible for human ingenuity to deduce a single inference. "It was not," says Locke, "the influence of those maxims which are taken for principles in mathematics, that hath led the masters of that science to those wonderful discoveries they have made. Let a man of good parts know all the maxims generally made use of in mathematics never so perfectly, and contemplate their extent and consequences as much as he pleases, he will, by their assistance, I suppose, scarce ever come to know, that 'the square of the hypothenuse in a right angled triangle, is equal to the squares of the two other sides.' The knowledge that 'the whole is equal to all its parts,' and, 'if you take equals from equals, the remainders will be equal,' helped him not, I presume, to this demonstration; and a man may, I think, pore long enough on these axioms, without ever seeing one jot the more of mathematical truths." But surely, if this be granted, and if, at the same time, by the first principles of a science be meant those fundamental propositions from which its remoter truths are derived, the axioms cannot, with any consistency, be called the first principles of mathematics. They have not, it will be admitted, the most distant analogy to what are called the first principles of natural philosophy; — to those general facts, for example, of the gravity and elasticity of the air, from which may be deduced, as consequences, the suspension of the mercury in the Torricellian tube, and its fall when carried up to an eminence. According to this meaning of the word, the principles of mathematical science are, *not the axioms, but the definitions;* which definitions hold, in mathematics, precisely the same place that is held in natural philosophy by such general facts as have now been referred to.*

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* In order to prevent cavil, it may be necessary for me to remark here, that when I speak of mathematical axioms, I have in view only such as are of the same description with the first nine of those which are prefixed to the Elements of Euclid; for, in that list, it is well known, that there are several which belong to a class of propositions altogether different from the others. That "all right angles (for example) are equal to one another;" that "when one straight line falling on two other straight lines makes the two interior angles on the same side less than two right angles, these two straight lines, if produced, shall meet on the side, where are the two angles less than two right angles;" are manifestly principles which bear no analogy to such barren truisms as these, "Things that are equal to one and the same thing, are equal to one another." "If equals be added to equals, the wholes are equal." "If equals be taken from equals, the remainders are equal." Of these propositions, the two former (the 10th and 11th axioms, to wit, in Euclid's list) are evidently *theorems* which, in point of strict logical accuracy, ought to be demonstrated; as may be easily done, with respect to the first, in a single sentence. That the second has not yet been proved in a simple and satisfactory manner, has been long considered as a sort of reproach to mathematicians; and I have little doubt that this reproach will continue to exist, till the basis of the science be somewhat enlarged, by the introduction of one or two new definitions, to serve as additional principles of geometrical reasoning.

[Dr. Whewell and Mr. J. S. Mill have engaged in this discussion

From what principle are the various properties of the circle derived, but from the definition of a circle? From what prin-

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respecting the nature of axioms and the first principles of mathematical reasoning, the former controverting, and the latter supporting, the opinions of Mr. Stewart. Yet the admission made by Stewart in the former part of this note seems to take away much of the ground of controversy between him and Dr. Whewell. It seems to be admitted on all hands, by Mr. Mill as well as by Mr. Stewart, that what Dr. Whewell calls "the peculiar geometrical axioms," such as the 10th and 11th of Euclid, *are* among the first principles of geometry, — that, far from being barren truisms, like the first nine, proper inferences can be deduced from them, and the whole structure of geometry could not be built up without their aid. The only doubt is, whether they are properly called *axioms*, whether they should not be considered rather as *theorems*, or propositions which ought to be demonstrated, though geometricians have not as yet succeeded in proving them. On the other hand, Dr. Whewell does not assert that geometrical reasoning rests *exclusively* upon axioms, but allows that definitions must be classed with them, both together constituting the first principles of the science. He urges, "that no one has yet been able to construct a system of mathematical truths by the aid of definitions *alone;* that a definition would not be admissible or applicable, except it agreed with a distinct conception in the mind; that the definitions which we employ in mathematics are not arbitrary or hypothetical, but necessary definitions; and that the real foundation of the truths of mathematics is the *idea of space*, which may be expressed, for purposes of demonstration, partly by definitions and partly by axioms."

Mr. Mill answers, "Those who say that the premises of geometry are hypotheses, are not bound to maintain them to be hypotheses which have no relation whatever to fact. Since an hypothesis framed for the purpose of scientific inquiry must relate to something which has real existence, (for there can be no science respecting nonentities,) it follows, that any hypothesis which we make respecting an object, to facilitate our study of it, must not involve any thing which is distinctly false, and repugnant to its real nature; we must not ascribe to the thing any property, which it has not; our liberty extends only to suppressing some of those which it has, under the indispensable obligation of restoring them whenever, and as far as, their presence or absence would make any material difference in the truth of our conclusion. Of this nature, accordingly, are the first principles involved in the definitions of geometry. In their *positive* part, they are observed facts; it is only in their *negative* part that they are hypothetical."

It had been previously remarked by Mr. Mill, that "there exist no real ciple the properties of the parabola or ellipse, but from the definitions of these curves? A similar observation may be extended to all the other theorems which the mathematician demonstrates; and it is this observation (which, obvious as it may seem, does not appear to have occurred, in all its force,

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things exactly conformable to the definitions. There exist no points without magnitude; no lines without breadth, nor perfectly straight; no circles with all their radii exactly equal, nor squares with all their angles perfectly right." "To get rid of this difficulty, and, at the same time, to save the credit of the supposed systems of necessary truth, it is customary to say that the points, lines, circles, and squares which are the subject of geometry, exist in our conceptions merely, and are part of our minds; which minds, by working on their own materials, construct an *à priori* science, the evidence of which is purely mental, and has nothing whatever to do with outward experience." This doctrine, however, he maintains to be psychologically incorrect; for "we cannot *conceive* a line without breadth; we can form no mental picture of such a line; all the lines which we have in our minds are lines possessing breadth." "A line, as defined by geometers, is wholly inconceivable. We can reason about a line," he admits, "*as if* it had no breadth;" but this is only because we have a power of *attending* to a *part* of our perception or conception, instead of the *whole.* The conclusion, therefore, in geometry, is only so far an *approximation to the truth,* as the points, lines, circles, etc., which are described in the definitions, are approximations to the real lines, circles, etc., which actually exist.

"The peculiar accuracy," continues Mr. Mill, "supposed to be characteristic of the first principles of geometry, thus appears to be fictitious. The assertions, on which the reasonings of the science are founded, do not, any more than in other sciences, exactly correspond with the fact; but we *suppose* that they do so, for the sake of tracing the consequences which follow from the supposition. The opinion of Dugald Stewart respecting the foundations of geometry, is, I conceive, substantially correct; — that it is built upon hypotheses; that it owes to this alone the peculiar certainty supposed to distinguish it; and that, in any science whatever, by reasoning from a set of hypotheses, we may obtain a body of conclusions as certain as those of geometry; — that is, as strictly in accordance with the hypotheses, and as irresistibly compelling assent *on condition* that those hypotheses are true. When, therefore, it is affirmed that the conclusions of geometry are necessary truths, the necessity consists in reality only in this, that they necessarily follow from the suppositions from which they are deduced. These suppositions are so far from being necessary, that they are not even true; they purposely depart, more or less widely, from the truth." — Mill's *Logic*, Am. ed. pp. 148–151.

either to Locke, to Reid, or to Campbell,) that furnishes, if I mistake not, the true explanation of the peculiarity already remarked in mathematical evidence.

But the truth of the axioms is presupposed or implied in all our reasonings.—After what has been just stated, it is scarcely necessary for me again to repeat, with regard to mathematical axioms, that although they are not *the principles* of our reasoning, either in arithmetic or in geometry, their truth is supposed or implied in all our reasonings in both; and, if it were called in question, our further progress would be impossible. In both of these respects, we shall find them analogous to the other classes of primary or elemental truths, which remain to be considered.

Nor let it be imagined, from this concession, that the dispute turns merely on the meaning annexed to the word *principle.* It turns upon an important question of fact; whether the theorems of geometry rest on the axioms, in the same sense in which they rest on the definitions? or (to state the question in a manner still more obvious) whether axioms hold a place in geometry at all analogous to what is occupied in natural philosophy, by those sensible phenomena which form the basis of that science? Dr. Reid compares them sometimes to the one set of propositions, and sometimes to the other. If the foregoing observations be just they bear no analogy to either.

What are 'first principles' in science.— The difference of opinion between Locke and Reid, of which I took notice in the foregoing part of this section, appears greater than it really is, in consequence of an ambiguity in the word *principle*, as employed by the latter. In its proper acceptation, it seems to me to denote *an assumption*, (whether resting on fact or on hypothesis,) *upon which, as a datum, a train of reasoning proceeds;* and for the falsity or incorrectness of which, no logical rigor in the subsequent process can compensate. Thus the gravity and the elasticity of the air, are principles of reasoning in our speculations about the barometer. The equality of the angles of incidence and reflection; the proportionality of the sines of incidence and refraction; are principles of reasoning in catoptrics and in dioptrics. In a sense perfectly analogous to this, the definitions of geometry (all of which are merely hypothetical) are the first principles of reasoning in the subsequent demonstrations, and the basis on which the whole fabric of the science rests.

I have called this the proper acceptation of the word, because it is that in which it is most frequently used by the best writers. It is also most agreeable to the literal meaning which its etymology suggests, expressing *the original point* from which our reasoning sets out or commences.

Dr. Reid often uses the word in this sense, as, for example, in the following sentence: "From three or four axioms, which he calls *regulæ philosophandi*, together with the phenomena observed by the senses, which he likewise lays down as *first principles*, Newton deduces, by strict reasoning, the propositions contained in the third book of his Principia, and in his Optics."

Another signification of 'first principles.' — On other occasions, he uses the same word to denote *those elemental truths* (if I may use the expression) *which are virtually taken for granted or assumed, in every step of our reasoning;* and without which, although no consequences can be directly inferred from them, a train of reasoning would be impossible. Of this kind, *in mathematics*, are *the axioms*, or (as Mr. Locke and others frequently call them) the maxims; *in physics, a belief of the continuance of the Laws of Nature; in all our reasonings*, without exception, *a belief in our own identity, and in the evidence of memory.* Such truths are the last elements into which reasoning resolves itself, when subjected to a metaphysical analysis, and which no person but a metaphysician or a logician ever thinks of stating in the form of propositions, or even of expressing verbally to himself. It is to truths of this description, that Locke seems, in general, to apply the name of *maxims;* and, in this sense, it is unquestionably true, that *no science* (*not even geometry*) *is founded on maxims as its first principles.*

Distinction between principles of reasoning and elements of reasoning. — In one sense of the word *principle*, indeed, max ims may be called principles of reasoning; for the words principles and elements are sometimes used as synonymous. Nor do I take upon me to say that this mode of speaking is exceptionable. All that I assert is, that they cannot be called principles of reasoning, in the sense which has just now been defined; and that accuracy requires, that the word, on which the whole question hinges, should not be used in both senses, in the course of the same argument. It is for this reason, that I have employed the phrase *principles of reasoning* on the *one* occasion, and *elements of reasoning* on the *other.*

It is difficult to find unexceptionable language, to mark distinctions so completely foreign to the ordinary purposes of speech; but, in the present instance, the line of separation is strongly and clearly drawn by this criterion, — that *from principles of reasoning, consequences may be deduced; from* what I have called *elements of reasoning, none ever can.*

A process of logical reasoning has often been likened to a chain supporting a weight. If this similitude be adopted, the axioms, or elemental truths now mentioned, may be compared to the successive concatenations which connect the different links immediately with each other; the principles of our reasoning resemble the hook, or rather the beam, from which the whole is suspended.*

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* D'Alembert has defined the word *principle* exactly in the sense in which I have used it; and has expressed himself (at least on one occasion) nearly as I have done, on the subject of axioms.

" What, then, are the truths which are entitled to have a place in the elements of philosophy? They are of two kinds; those which form the head of each part of the chain, and those which are to be found at the points where different branches of the chain unite together.

" Truths of the first kind are distinguished by this, — that they do not depend on any other truths, and that they possess within themselves the whole grounds of their evidence. Some of my readers will be apt to suppose, that I here mean to speak of axioms; but these are not the truths which I have at present in view. With respect to this last class of principles, I must refer to what I have elsewhere said of them; that, notwithstanding their truth, they add nothing to our information; and that the palpable evidence which accompanies them, amounts to nothing more

III. *Of certain laws of belief, inseparably connected with the exercise of consciousness, memory, perception, and reasoning.* — 1. It is by the immediate evidence of *consciousness*,* that we are assured of the present existence of our various sensations, whether pleasant or painful; of all our affections, passions, hopes, fears, desires, and volitions. It is thus, too, we are assured of the present existence of those thoughts which, during our waking hours, are continually passing through the mind, and of all the different effects which they produce in furnishing employment to our intellectual faculties.

How we come to a knowledge of our own existence. — According to the common doctrine of our best philosophers, it is by the evidence of consciousness we are assured that we ourselves exist. The proposition, however, when thus stated, is not accurately true; for *our own existence*, as I have elsewhere observed, *is not a direct or immediate object of consciousness*, in the strict and logical meaning of that term. We are conscious of *sensation, thought, desire, volition;* but we are not conscious of *the existence of mind itself;* nor would it be possible for us to arrive at the knowledge of it, (supposing us to be created in the full possession of all the intellectual capacities which belong to human nature,) if no impressions were ever made on our external senses. The moment that, in consequence of such an impression, a sensation is excited, we learn *two facts* at once; — *the existence of the sensation*, and *our own existence* as sentient beings; — in other words, the very first exercise of consciousness necessarily implies a belief, not only of the present existence of what is felt, but of the present existence of that which feels and thinks; or (to employ plainer language) the present existence of that being which I denote by the words I and myself. Of these facts, however, it is the former alone of which

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than to an expression of the same idea, by means of two different terms. On such occasions, the mind only turns to no purpose about its own axis, without advancing forward a single step. Accordingly, axioms are so far from holding the highest rank in philosophy, that they scarcely deserve the distinction of being formally enunciated."

[* See note to page 3.]

we can properly be said to be conscious, agreeably to the rigorous interpretation of the expression. A conviction of the latter, although it seems to be so inseparable from the exercise of consciousness, that it can scarcely be considered as posterior to it in the order of time, is yet (if I may be allowed to make use of a scholastic distinction) posterior to it in the order of nature; not only as it supposes consciousness to be already awakened by some sensation, or some other mental affection; but as it is evidently rather a judgment accompanying the exercise of that power, than one of its immediate intimations concerning its appropriate class of internal phenomena. It appears to me, therefore, more correct to call the belief of our own existence a concomitant, or accessory, of the exercise of consciousness, than to say, that our own existence is a fact falling under the immediate cognizance of consciousness, like the existence of the various agreeable or painful sensations which external objects excite in our minds.

2. *Not consciousness, but memory, proves our personal identity.* — That we cannot, without a very blamable latitude in the use of words, be said to be conscious of our personal identity, is a proposition still more indisputable; inasmuch as the very idea of personal identity involves the idea of time, and, consequently, presupposes the exercise not only of consciousness, but of memory. The belief connected with this idea is implied in every thought and every action of the mind, and may be justly regarded as one of the simplest and most essential elements of the understanding. Indeed, it is impossible to conceive either an intellectual or an active being to exist without it. It is, however, extremely worthy of remark, with respect to this belief, that, universal as it is among our species, nobody but a metaphysician ever thinks of expressing it in words, or of reducing into the shape of a proposition the truth to which it relates. To the rest of mankind, it forms, not an object of knowledge, but a condition or supposition, necessarily and unconsciously involved in the exercise of all their faculties. On a part of our constitution, which is obviously one of the last or primordial elements at which it is possible to arrive in analyzing our intel-

lectual operations, it is plainly unphilosophical to suppose, that any new light can be thrown by metaphysical discussion. All that can be done with propriety in such cases, is to state the fact.

3. *Other elemental laws of thought.* — The belief which all men entertain of *the existence of the material world,* (I mean their belief of its existence independently of that of percipient beings,) and their expectation of *the continued uniformity of the laws of nature,* belong to the same class of ultimate or elemental laws of thought with those which have been just mentioned. The truths which form their objects are of an order so radically different from what are commonly called truths, in the popular acceptation of that word, that it might perhaps be useful for logicians to distinguish them by some appropriate appellation, such, for example, as that of *metaphysical* or *transcendental truths. They are not principles or data* (as will afterwards appear) *from which any consequence can be deduced;* but form a part of those *original stamina of human reason,* which are equally essential to all the pursuits of science, and to all the active concerns of life.

4. *Confidence necessarily reposed on memory.* — I shall only take notice further, under this head, of the confidence which we must necessarily repose in the evidence of memory, (and I may add, in the continuance of our personal identity,) when we are employed in carrying on any process of deduction or argumentation; — in following out, for instance, the steps of a long mathematical demonstration. In yielding our assent to the conclusion to which such a demonstration leads, we evidently trust to the fidelity with which our memory has connected the different links of the chain together. The reference which is often made, in the course of a demonstration, to propositions formerly proved, places the same remark in a light still stronger; and shows plainly, that, in this branch of knowledge, which is justly considered as the most certain of any, the authority of the same laws of belief which are recognized in the ordinary pursuits of life, is tacitly acknowledged. *Deny the evidence of memory* as a ground of certain knowledge, *and you destroy the foundations*

of mathematical science as completely as if you were to deny the truth of the axioms assumed by Euclid.

The foregoing examples sufficiently illustrate the nature of that class of truths which I have called *Fundamental Laws of Human Belief*, or *Primary Elements of Human Reason*. A variety of others, not less important, might be added to the list;* but these I shall not at present stop to enumerate, as my chief object in introducing the subject here, was to explain the common relation in which they all stand to deductive evidence. In this point of view, two analogies, or rather coincidences, between the truths which we have been last considering, and the mathematical axioms which were treated of formerly, immediately present themselves to our notice.

Analogies between these elemental truths and mathematical axioms. — 1. From neither of these classes of truths can any direct inference be drawn for the further enlargement of our knowledge. This remark has been already shown to hold universally with respect to the *axioms* of geometry; and it applies equally to what I have called *Fundamental Laws of Human Belief*. From such propositions as these, — *I exist; I am the same person to-day, that I was yesterday; the material world has an existence independent of my mind; the general laws of nature will continue, in future, to operate uniformly as in time past,* — no inference can be deduced, any more than from the intuitive truths prefixed to the Elements of Euclid. Abstracted from other data, they are perfectly *barren* in themselves; nor can any possible combination of them help the mind forward one single step in its progress. It is for this reason, that instead of calling them, with some other writers, *first principles*, I have distinguished them by the title of *fundamental laws of belief;* the former word seeming to me to denote, according to common usage, some fact, or some supposition, from which a series of consequences may be deduced.

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* Such, for example, as our belief of the existence of efficient causes; our belief of the existence of other intelligent beings besides ourselves, etc. etc.

If the account now given of these laws of belief be just, the great argument which has been commonly urged in support of their authority, and which manifestly confounds them with what are properly called principles of reasoning, is not at all applicable to the subject; or, at least, does not rest the point in dispute upon its right foundation. If there were no first principles, (it has been said,) or, in other words, if a reason could be given for every thing, no process of deduction could possibly be brought to a conclusion.*

The remark is indisputably true; but it only proves (what no logician of the present times will venture to deny) that the mathematician could not demonstrate a single theorem, unless he were first allowed to lay down his *definitions;* nor the natural philosopher, explain or account for a single phenomenon, unless he were allowed to assume, as acknowledged facts, certain general *laws of nature.* What inference does this afford in favor of that particular class of truths to which the preceding observations relate, and against which the ingenuity of modern skeptics has been more particularly directed? If I be not deceived, these truths are still more intimately connected with the operations of the reasoning faculty than has been generally imagined; *not as the principles* (αρχαι) from which our reasonings set out, and on which they ultimately depend; *but as the necessary conditions on which every step of the deduction tacitly proceeds;* or rather (if I may use the expression) as essential elements which enter into the composition of *reason itself.*

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* Aristotle himself has more than once made this remark; more particularly in discussing the absurd question, Whether it be possible for the same thing to be and not to be? Αξιουσι δε και τουτο αποδεικνυναι τινες δι' απαιδευσιαν. Εστι γαρ απαιδευσια, το μη γινωσκειν τινων δει ζητειν αποδειξιν, και τινων ου δει. Ὁλως μεν γαρ ἁπαντων αδυνατον αποδειξιν ειναι. Εις απειρον γαρ αν βαδιζοι· ὡστε μηδ' οὑτως ειναι αποδειξιν. — Aristot. *Metaphys.* vol. ii. p. 873. Edit. du Val.

"But there are some who, through ignorance, make an attempt to prove even this principle, (that it is impossible for the same thing to be and not to be). For it is a mark of ignorance not to be able to distinguish those things which ought to be demonstrated from things of which no demonstration should be attempted. In truth, it is altogether impossible that every thing should be susceptible of demonstration; otherwise, the process would extend to infinity, and, after all our labor, nothing would be gained." In the sentence immediately preceding this quotation, Aristotle calls the maxim in question, βεβαιοτατη των αρχων πασων, "the most certain of all principles."

To the same purpose, Dr. Reid has said, "I hold it to be certain, and even demonstrable, that all knowledge got by reasoning, must be built on first principles. This," he adds, "is as certain as that every house must have a foundation."

2. In this last remark, I have anticipated, in some measure, what I had to state with respect to the second coincidence alluded to, between mathematical axioms and the other propositions which I comprehended under the general title of fundamental laws of human belief. As the truth of axioms is virtually presupposed, or implied, in the successive steps of every demonstration, so, *in every step of our reasonings concerning the order of nature, we proceed on the supposition, that the laws by which it is regulated, will continue uniform as in time past; and that the material universe has an existence independent of our perceptions.* I need scarcely add, that, in *all our reasonings whatever*, whether they relate to necessary or to contingent truths, *our own personal identity, and the evidence of memory, are virtually taken for granted.* These different truths all agree in this, that they are essentially involved in the exercise of our rational powers; although, in themselves, they furnish no principles or data by which the sphere of our knowledge can, by an ingenuity, be enlarged. They agree, further, in being *tacitly acknowledged by all men, learned or ignorant,* without any formal enunciation in words, or even any conscious exercise of reflection. It is only at that period of our intellectual progress, when scientific arrangements and metaphysical refinements begin to be introduced, that they become objects of attention to the mind, and assume the form of propositions.

Objections to the phrase, principles of common sense.—To the class of truths which I have here called *laws of belief,* or *elements of reason,* the title of *principles of common sense* was long ago given by Father Buffier, whose language and doctrine concerning them bear a very striking resemblance to those of some of our later Scottish logicians. This, at least, strikes me as the meaning which these writers, *in general*, annex to the phrase; although all of them have frequently employed it with a far greater degree of latitude. When thus limited in its acceptation, it is obviously liable, in point of scientific accuracy, to two very strong objections, both of which have been already sufficiently illustrated. The first is, that it applies the appellation of *principles* to laws of belief from which no inference can be deduced; the second, that it refers the origin of these laws to *common sense*. Nor is this phraseology more agreeable to popular use than to logical precision. If we were to suppose an individual whose conduct betrayed a disbelief of his own existence, or of his own identity, or of the reality of surrounding objects, it would, by no means, amount to an adequate description of his condition, to say, that he was destitute of *common sense*. We should at once pronounce him to be destitute of *reason*, and would no longer consider him as a fit subject of discipline or of punishment. The former expression, indeed, would only imply that he was apt to fall into absurdities and improprieties in the common concerns of life. To denominate, therefore, such laws of belief as we have now been considering, *constituent elements of human reason*, while it seems quite unexceptionable in point of technical distinctness, cannot be justly censured as the slightest deviation from our habitual forms of speech. On the same grounds, it may be fairly questioned, whether the word *Reason* would not, on some occasions, be the best substitute which our language affords for *intuition*, in that enlarged acceptation which has been given to it of late. If not quite so definite and precise as might be wished, it would be at least employed in one of those significations in which it is already familiar to every ear; whereas the meaning of *intuition*, when used for the same purpose, is stretched very far beyond its ordinary limits. And in cases of this sort, where we have to choose between two terms, neither of which is altogether unexceptionable, it will be found much safer to trust to the context for restricting, in the reader's mind, what is too general, than for enlarging what use has accustomed us to interpret in a sense too narrow.*

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* [In his "Account of the Life and Writings of Dr. Reid," Mr. Stewart remarks, "that the question about the propriety of the phrase *common sense* must be decided by an appeal to general practice; for, although it be allowable, and even necessary, for a philosopher to limit the acceptation of words which are employed vaguely in common discourse, it is always dangerous to give to a word a scientific meaning essentially distinct from that in which it is usually understood. It has, at least, the effect of misleading those who do not enter deeply into the subject; and of giving a paradoxical appearance to doctrines, which, if expressed in more unexceptionable terms, would be readily admitted.

"It appears to me, that this has actually happened in the present instance. The phrase *common sense,* as it is generally understood, is nearly synonymous with *mother wit,* denoting that degree of sagacity, depending partly on original capacity, and partly on personal experience and observation, which qualifies an individual for those simple and essential occupations which all men are called on to exercise habitually by their common nature. In this acceptation, it is opposed to those mental acquirements which are derived from a regular education and from the study of books; and refers, not to the speculative convictions of the understanding, but to that prudence and discretion which are the foundation of successful conduct. Such is the idea which Pope annexes to the word, when, speaking of *good sense,* which means only a more than ordinary share of *common sense,* he calls it

"the gift of heaven,
And though no science, fairly worth the seven."

"To speak, accordingly, of appealing from the conclusions of *philosophy* to *common sense,* had the appearance, to title-page readers, of appealing from the verdict of the learned to the voice of the multitude; or of attempting to silence free discussion, by a reference to some arbitrary and undefinable standard, distinct from any of the intellectual powers hitherto enumerated by logicians. Whatever countenance may be supposed to have been given by some writers to such an interpretation of this mode of expression, I may venture to assert that none is afforded by the works of Dr. Reid. The standard to which he appeals, is neither the creed of a particular sect, nor the inward light of enthusiastic presumption; but *that constitution of haman nature, without which all the business of the world would immediately cease;* and the substance of his doctrine amounts merely to this, that *those essential laws of belief, to which skeptics have objected when considered in connection with our scientific reasonings, are implied in every step*

I must add, too, in opposition to the high authorities of Dr. Johnson and Dr. Beattie, that, for many years past, *Reason* has been very seldom used by philosophical writers, or, indeed, by correct writers of any description, as synonymous with the power of *reasoning*. To appeal to the light of human reason from the reasonings of the schools, is surely an expression to

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we take as active beings; and if called in question by any man in his practical concerns, would expose him universally to the charge of insanity."

Sir William Hamilton adheres to the phrase *Philosophy of Common Sense*, and thus argues in favor of its strictly scientific and authoritative character. "How, it is asked, do these primary propositions — these cognitions at first hand — these fundamental facts, feelings, beliefs, certify us of their own veracity? To this the only possible answer is — that as elements of our mental constitution — as the essential conditions of our knowledge — they *must* by us be accepted as true. To suppose their falsehood, is to suppose that we are created capable of intelligence, in order to be made the victims of delusion; that God is a deceiver, and the root of our nature a lie. But such a supposition, if gratuitous, is manifestly illegitimate. For, on the contrary, the data of our original consciousness must, it is evident, *in the first instance*, be presumed true. It is only if proved false, that their authority can, *in consequence of that proof*, be, in the second instance, disallowed. Speaking, therefore, generally, to argue from common sense, is simply to show, that the denial of a given proposition would involve the denial of some original datum of consciousness; but as every original datum of consciousness is to be presumed true, that the proposition in question, as dependent on such a principle, must be admitted.

"Here, however, it is proper to take a distinction between the data or deliverances of consciousness considered simply, *in themselves, as apprehended facts or actual manifestations*, and those deliverances considered *as testimonies to the truth of facts beyond their own phenomenal reality.*

"Viewed under the former limitation, they are beyond all skepticism. For as doubt is itself only a manifestation of consciousness, it is impossible to doubt that, *what consciousness manifests it does manifest*, without, in thus doubting, doubting that we actually doubt; that is, without the doubt contradicting and therefore annihilating itself. Hence it is, that the facts of consciousness, as mere phenomena, are, by the unanimous confession of all Skeptics and Idealists, ancient and modern, placed high above the reach of question.

"Though the argument from common sense is an appeal to the natural convictions of mankind, it is not an appeal from philosophy to blind feeling. It is only an appeal from the heretical conclusions of particular which no good objection can be made, on the score either of vagueness or of novelty. Nor has the *etymological affinity* between these two words, the slightest tendency to throw any obscurity on the foregoing expression. On the contrary, this affinity may be of use in some of our future arguments, by

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philosophers, to the catholic principles of all philosophy. The prejudice which, on this supposition, has sometimes been excited against the argument, is groundless.

"Nor is it true, that the argument from common sense denies the decision to the judgment of philosophers, and accords it to the verdict of the vulgar. Nothing can be more erroneous. We admit — nay, we maintain, as D'Alembert well expresses it, "that the truth in metaphysic, like the truth in matters of taste, is a truth of which all minds have the germ within themselves; to which, indeed, the greater number pay no attention, but which they recognize the moment it is pointed out to them. But if, in this sort, all are able to understand, all are not able to instruct. The merit of conveying easily to others true and simple notions, is much greater than is commonly supposed; for experience proves how rarely this is to be met with. Sound metaphysical ideas are common truths which every one apprehends, but which few have the talent to develop. So difficult is it, on any subject, to make our own what belongs to every one." Or, to employ the words of the ingenious Lichtenberg — "Philosophy, twist the matter as we may, is always a sort of chemistry. The peasant employs all the principles of abstract philosophy, only *enveloped, latent, engaged,* as the men of physical science express it; the philosopher exhibits the pure principle."

"The first problem of Philosophy — and it is one of no easy accomplishment — being thus to seek out, purify, and establish, by intellectual analysis and criticism, the elementary feelings or belief, in which are given the elementary truths of which all are in possession; and the argument from common sense being the allegation of these feelings or beliefs as explicated and ascertained, in proof of the relative truths and their necessary consequences; — this argument is manifestly dependent on philosophy, as an art, as an acquired dexterity, and cannot, notwithstanding the errors which they have so frequently committed, be taken out of the hands of the philosophers. Common Sense is like Common Law. Each may be laid down as the general rule of decision; but in the one case, it must be left to the jurist, in the other, to the philosopher, to ascertain what are the contents of the rule; and though, in both instances, the common man may be cited as a witness, for the custom or the fact, in neither can he be allowed to officiate as advocate or as judge." — *Supplementary Dissertations to Reid,* pp. 743, 744, 751, 752.]

keeping constantly in view, the close and inseparable connection which will be afterwards shown to exist between the two different intellectual operations which are thus brought into immediate contrast.

Opinions of the ancients respecting the argument from universal consent. — "Those things are to be regarded as first truths, [says Aristotle,] the credit of which is not derived from other truths, but is inherent in themselves. As for probable truths, they are such as are admitted by all men, or by the generality of men, or by wise men; and, among these last, either by all the wise, or by the generality of the wise, or by such of the wise as are of the highest authority."

The argument from Universal Consent, on which so much stress is laid by many of the ancients, is the same doctrine with the foregoing, under a form somewhat different. It is stated with great simplicity and force by a Platonic philosopher, [Maximus Tyrius,] in the following sentences: —

"In such a contest, and tumult, and disagreement, (about other matters of opinion,) you may see this one law and language acknowledged by common accord. This the Greek says, and this the barbarian says; and the inhabitant of the continent, and the islander; and the wise, and the unwise."

Objection to which the argument is liable. — It cannot be denied, that against this summary species of logic, when employed without any collateral lights, as an infallible touchstone of philosophical truth, a strong objection immediately occurs. By what test, it may be asked, is a principle of common sense to be distinguished from one of those prejudices to which the whole human race are irresistibly led, in the first instance, by the very constitution of their nature? If no test or criterion of truth can be pointed out but universal consent, may not all those errors which Bacon has called *idola tribus*,* claim a right to admission among the incontrovertible maxims of science? And might not the popular cavils against the supposition of the earth's motion, which so long obstructed the progress of the Copernican system have been legitimately opposed, as a reply of paramount authority, to all the scientific reasonings by which it was supported?

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* [*Idols of the Tribe,* as they are called in the fanciful nomenclature of Lord Bacon, are the errors and prejudices to which *all* men (the whole *tribe*) are liable, because they grow out of the natural imperfections and biases of the human understanding. "For the light of the human intel-

Criteria of First Truths.—It is much to be wished that this objection, of which Dr. Reid could not fail to be fully aware, had been more particularly examined and discussed in some of his publications, than he seems to have thought necessary. From different parts of his works, however, various important hints towards a satisfactory answer to it might be easily collected. At present, I shall only remark, that although universality of belief is one of the tests by which, according to him, a principle of common sense is characterized, it is not the only test which he represents as essential. Long before his time, Father Buffier, in his excellent treatise on First Truths, had laid great stress on two other circumstances, as criteria to be attended to on such occasions; and although I do not recollect any passage in Reid where they are so explicitly stated, yet the general spirit of his reasonings plainly shows, that he had them constantly in view, in all the practical applications of his doctrine. The first criterion mentioned by Buffier is, "*That the truths assumed as maxims of common sense should be such, that it is impossible for any disputant either to defend or to attack them, but by means of propositions which are neither more manifest nor more certain than the propositions in question.*" The

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lect," says Lord Bacon, "is not dry light; but it receives diverse stains and hues from the will and the affections, and thus creates such sciences as it longs for; for it readily believes what it wishes to be true." And again, "It is wrong to say, that the senses are the proper measures of things; for all our perceptions, whether of sense or of the intellect, conform rather to the nature of the observer, than to the nature of the thing observed. The human mind is like a mirror imperfectly polished and inaccurately shaped, which imparts its own qualities to the objects reflected in it, distorting and staining them."—*Nov. Organum,* Aph. XLI. and XLIX. paraphrased.]

second criterion is, "*That their practical influence should extend even to those individuals who affect to dispute their authority.*"

To these remarks of Buffier, it may not be altogether superfluous to add, that, wherever a prejudice is found to obtain universally among mankind in any stage of society, *this prejudice must have some foundation in the general principles of our nature*, and must proceed upon some truth or fact inaccurately apprehended or erroneously applied. The suspense of judgment, therefore, which is proper with respect to particular opinions, till they be once fairly examined, can never justify scepticism with respect to the general laws of the human mind. Our belief of the sun's motion, is not a conclusion to which we are necessarily led by any such law, but an inference rashly drawn from the perceptions of sense, which do not warrant such an inference. All that we see is, that a relative change of position between us and the sun takes place; and this fact, which is made known to us by our senses, no subsequent discovery of philosophy pretends to disprove. It is not, therefore, the evidence of perception which is overturned by the Copernican system, but a judgment or inference of the understanding, of the rashness of which every person must be fully sensible, the moment he is made to reflect with due attention on the circumstances of the case; and the doctrine which this system substitutes, instead of our first crude apprehensions on the subject, is founded, not on any process of reasoning *à priori*, but on the demonstrable inconsistency of these apprehensions with the various phenomena which our perceptions present to us. Had Copernicus not only asserted the stability of the sun, but, with some of the Sophists of old, denied that any such thing as motion exists in the universe, his theory would have been precisely analogous to that of the non-existence of matter; and no answer to it could have been thought of more pertinent and philosophical, than that which Plato is said to have given to the same paradox in the mouth of Zeno, by rising up and walking before his eyes.

CHAPTER IX.

OF REASONING AND OF DEDUCTIVE EVIDENCE.

I. *Doubts with respect to Locke's distinction between the powers of intuition and reasoning.*—Although, in treating of this branch of the philosophy of the mind, I have followed the example of preceding writers, so far as to speak of *intuition* and *reasoning* as two different faculties of the understanding, I am by no means satisfied that there exists between them that radical distinction which is commonly apprehended. Dr. Beattie, in his Essay on Truth, has attempted to show, that, how closely soever they may in general be connected, yet that this connection is not necessary; insomuch that a being may be conceived endued with the one, and at the same time destitute of the other. Something of this kind, he remarks, takes place in *dreams* and in *madness;* in both of which states of the system, the power of *reasoning* appears occasionally to be retained in no inconsiderable degree, while the power of *intuition* is suspended or lost.* But this doctrine is liable to obvious and to insurmountable objections; and has plainly taken its rise from the vagueness of the phrase *common sense*, which the author employs, through the whole of his argument, as synonymous with the power of *intuition*. Of the indissoluble connection between the last power and that of reasoning, no other proof is necessary than the following consideration, that, "in every step which reason makes in demonstrative knowledge, there must be intuitive certainty;" a proposition which Locke has excellently illustrated, and which, since his time, has been acquiesced in, so far as I know, by philosophers of all descriptions. From this proposition (which, when properly interpreted, appears to me to be perfectly just) it obviously follows, that *the power of reasoning presupposes the power of intuition;* and, therefore, the only question about which any doubt can be entertained is, *whether the power of intuition* (according to Locke's idea of it) *does not also imply that of reasoning?* My own opinion is, decidedly, that it does; at least, when *combined with* the faculty of *memory.* In examining those processes of thought which conduct the mind by a series of consequences from premises to a conclusion, I can detect no intellectual act whatever, which the joint operation of *intuition and of memory* does not sufficiently explain.

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* [Locke very acutely observes, that the difference between an idiot and a madman consists in this;—that a madman reasons correctly from wrong premises, while an idiot does not reason at all. "Thus you shall find a distracted man fancying himself a king, and, with a right inference, requiring suitable attendance, respect, and obedience; others, who have thought themselves made of glass, have used the caution necessary to preserve such brittle bodies." Now the wrong premises that the madman adopts are often *false sensations*, as the medical men call them; as when one

Reasoning resolved into intuition and memory. — Before, however, proceeding further in this discussion, it is proper for me to observe, by way of comment on the proposition just quoted from Locke, that, although "in a complete demonstration, there must be intuitive evidence at every step," it is not to be supposed that, in every demonstration, all the various intuitive judgments leading to the conclusion are actually presented to our thoughts. In by far the greater number of instances, we trust entirely to judgments resting upon the evidence of memory; by the help of which faculty, we are enabled to connect together the most remote truths, with the very same confidence as if the one were an immediate consequence of the other. Nor does this diminish,

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fancies that he hears voices in the air, or sees spectres, the voices and the sights being alike unreal. These imaginary perceptions would be denominated by Kant *false intuitions;* and if this be a proper use of language, Beattie properly distinguishes *intuition* from *reasoning,* when he affirms that we can conceive of a being endued with the one, and destitute of the other. An insane person is such a being; he reasons rightly, but his intuitive faculty is perverted. But Stewart here understands *intuition* to be, not a perception, but *an instantaneous judgment.*]

in the smallest degree, the satisfaction we feel in following such a train of reasoning. On the contrary, nothing can be more disgusting than a demonstration where even the simplest and most obvious steps are brought forward to view; and where no appeal is made to that stock of previous knowledge which memory has identified with the operations of reason. Still, however, it is true, that it is by a continued chain of intuitive judgments, that the whole science of geometry hangs together; inasmuch as the demonstration of any one proposition virtually includes all the previous demonstrations to which it refers.

Hence it appears, that, in mathematical demonstrations, we have not, at every step, the immediate evidence of intuition, but only the evidence of memory. Every demonstration, however, may be resolved into a series of separate judgments, either formed at the moment, or remembered as the results of judgments formed at some preceding period; and it is in the arrangement and concatenation of these different judgments, or media of proof, that the inventive and reasoning powers of the mathematician find so noble a field for their exercise.

With respect to these powers of judgment and of reasoning, as they are here combined, it appears to me, that the results of the former may be compared to a collection of separate stones prepared by the chisel for the purposes of the builder; upon each of which stones, while lying on the ground, a person may raise himself, as upon a pedestal, to a small elevation. The same judgments, when combined into a train of reasoning, terminating in a remote conclusion, resemble the formerly unconnected blocks, when converted into the steps of a staircase leading to the summit of a tower, which would be otherwise inaccessible. In the design and execution of this staircase, much skill and invention may be displayed by the architect; but, in order to ascend it, nothing more is necessary than a repetition of the act by which the first step was gained. The fact I conceive to be somewhat analogous, in the relation between the power of judgment, and what logicians call the discursive processes of the understanding.

Reasoning is a succession of intuitive judgments. — Mr.

Locke's language, in various parts of his Essay, seems to accord with the same opinion. "Every step in reasoning," he observes, "that produces knowledge, has intuitive certainty; which, when the mind perceives, there is no more required but to remember it, to make the agreement or disagreement of the ideas, concerning which we inquire, visible and certain. This intuitive perception of the agreement or disagreement of the intermediate ideas, in each step and progression of the demonstration, must also be carried exactly in the mind, and a man must be sure that no part is left out; which, in long deductions, and in the use of many proofs, the memory does not always so readily and exactly retain; therefore it comes to pass, that this is more imperfect than intuitive knowledge, and men embrace often falsehood for demonstrations."

The same doctrine is stated elsewhere by Mr. Locke, more than once, in terms equally explicit; and yet his language occasionally favors the supposition, that, in its deductive processes, the mind exhibits some modification of reason essentially distinct from intuition. The account, too, which he has given of their respective provinces, affords evidence that his notions concerning them were not sufficiently precise and settled. "When the mind," says he, "perceives the agreement or disagreement of two ideas immediately by themselves, without the intervention of any other, its knowledge may be called intuitive. When it cannot so bring its ideas together as, by their immediate comparison, and, as it were, juxtaposition, or application one to another, to perceive their agreement or disagreement, it is fain, by the intervention of other ideas, (one or more as it happens,) to discover the agreement or disagreement which it searches; and this is that which we call reasoning." According to these definitions, supposing the equality of two lines, A and B, to be perceived immediately, in consequence of their coincidence, the judgment of the mind is intuitive. Supposing A to coincide with B, and B with C; the relation between A and C is perceived by reasoning. Nor is this a hasty inference from Locke's accidental language. That it is perfectly agreeable to the foregoing definitions, as understood by their author, appears from the following passage, which occurs afterwards: "The principal act of ratiocination is the finding the agreement or disagreement of two ideas, one with another, by the intervention of a third. As a man, by a yard, finds two houses to be of the same length, which could not be brought together to measure their equality by juxtaposition."

This use of the words *intuition* and *reasoning*, is surely somewhat arbitrary. The truth of mathematical axioms has always been supposed to be intuitively obvious; and the first of these, according to Euclid's enumeration, affirms, that if A be equal to B, and B to C, A and C are equal. Admitting, however, Locke's definition to be just, it only tends to confirm what has been already stated with respect to the near affinity, or rather the radical identity, of intuition and of reasoning. When the relation of equality between A and B has once been perceived, A and B are completely identified as the same mathematical quantity; and the two letters may be regarded as synonymous, wherever they occur. The faculty, therefore, which perceives the relation between A and C, is the same with the faculty which perceives the relation between A and B, and between B and C.*

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* [Stewart's doctrine, that reasoning is nothing more than a series of intuitive judgments, seems to be true according to one signification of the word *reasoning*, and false according to another. The word *reasoning* is sometimes used to denote a series of propositions, or syllogisms, properly arranged, which constitute the proof of a particular doctrine; but it more frequently denotes, that act or process of the mind, by which the proper syllogisms, or intermediate propositions, are discovered and rightly put together, so as to constitute such a proof. This effort of mind may be a very laborious and difficult one, and would be improperly designated by such a word as *intuition*, which implies ease and instantaneousness of operation. Take the geometrical theorem, that the square described on the hypothenuse of a right-angled triangle is equal to the sum of the squares on the two other sides; it is proved by a series of propositions, the connection of each one of which with its predecessor, is seen intuitively. But if the old story is true, Pythagoras was so overjoyed when, after long study, he had succeeded in discovering these propositions, and putting them together so as to constitute a proof of the theorem, that he sacrificed a hecatomb of oxen to show his gratitude to the gods.]

In further confirmation of the same proposition, an appeal might be made to the structure of syllogisms. Is it possible to conceive an understanding so formed, as to perceive the truth of the major and of the minor propositions, and yet not to perceive the force of the conclusion? The contrary must appear evident to every person who knows what a syllogism is; or, rather, as in this mode of stating an argument, the mind is led from universals to particulars, it must appear evident, that, in the very statement of the major proposition, the truth of the conclusion is presupposed; insomuch, that it was not without good reason Dr. Campbell hazarded the epigrammatic, yet unanswerable remark, that "there is always some radical defect in a syllogism, which is not chargeable with that species of sophism, known among logicians by the name of *petitio principii*, or a begging of the question."

In what respect intuition differs from reasoning.—The idea which is commonly annexed to *intuition*, as opposed to *reasoning*, turns, I suspect, entirely on *the circumstance of time.* The former, we conceive to be *instantaneous;* whereas the latter necessarily involves the notion of *succession*, or of *progress.* This distinction is sufficiently precise for the ordinary purposes of discourse; nay, it supplies us, on many occasions, with a convenient phraseology; but in the theory of the mind, it has led to some mistaken conclusions, on which I intend to offer a few remarks in the second part of this section.

2. *Conclusions obtained by a process of deduction often mistaken for intuitive judgments.*—It has been frequently remarked, that the justest and most efficient understandings are often possessed by men who are incapable of stating to others, or even to themselves, the grounds on which they proceed in forming their decisions. In some instances, I have been disposed to ascribe this to the faults of early education; but in other cases, I am persuaded that it was the effect of active and imperious habits in quickening the evanescent processes of thought, so as to render them untraceable by the memory; and to give the appearance of intuition to what was, in fact, the result of a train of reasoning so rapid as to escape notice. This

I conceive to be the true theory of what is generally called *common sense*, in opposition to *book learning;* and it serves to account for the use which has been made of this phrase, by various writers, as synonymous with *intuition.*

Instantaneous judgments more trustworthy than deliberately formed conclusions. — These seemingly instantaneous judgments have always appeared to me as entitled to a greater share of our confidence, than many of our more deliberate conclusions; inasmuch as they have been forced, as it were, on the mind by the lessons of long experience; and are as little liable to be biased by temper or passion, as the estimates we form of the distances of visible objects. They constitute, indeed, to those who are habitually engaged in the busy scenes of life, a sort of peculiar faculty, analogous, both in its origin and in its use, to the *coup d' œil* of the military engineer, or to the quick and sure tact of the medical practitioner, in marking the diagnostics of disease.

For this reason, I look upon the distinction between our intuitive and deductive judgments as, in many cases, merely an object of theoretical curiosity. In those simple conclusions which all men are impelled to form, by the necessities of their nature, and in which we find an uniformity not less constant than in the acquired perceptions of sight, it is of as little consequence to the logician to spend his time in efforts to retrace the first steps of the infant understanding, as it would be to the sailor or the sportsman to study, with a view to the improvement of his eye, the Berkeleian theory of vision. In both instances, the original faculty and the acquired judgment are equally entitled to be considered as the work of nature; and in both instances, we find it equally impossible to shake off her authority. It is no wonder, therefore, that, in popular language, such words as *common sense* and *reason* should be used with a considerable degree of latitude; nor is it of much importance to the philosopher to aim at extreme nicety in defining their province, where all mankind, whether wise or ignorant, think and speak alike.

In some rare and anomalous cases, a rapidity of judgment in the more complicated concerns of life, appears in individuals who have had so few opportunities of profiting by experience, that it seems, on a superficial view, to be the immediate gift of heaven. But, in all such instances, (although a great deal must undoubtedly be ascribed to an inexplicable aptitude or predisposition of the intellectual powers,) we may be perfectly assured, that every judgment of the understanding is preceded by a process of reasoning or deduction, whether the individual himself be able to recollect it or not. Of this I can no more doubt, than I could bring myself to believe that the arithmetical prodigy who has, of late, so justly attracted the attention of the curious, is able to extract square and cube roots by an instinctive and instantaneous perception, because the process of mental calculation, by which he is led to the result, eludes all his efforts to recover it.

We may often judge rightly, while we reason ill.—It is remarked by Mr. Hume, with respect to the elocution of Oliver Cromwell, that "it was always confused, embarrassed, and unintelligible." "The great defect, however," he adds, "in Oliver's speeches consisted, not in his want of elocution, but in his want of ideas; the sagacity of his actions, and the absurdity of his discourse, forming the most prodigious contrast that ever was known." "In the great variety of human geniuses," says the same historian, upon a different occasion, "there are some which, though they see their object clearly and distinctly in general, yet when they come to unfold its parts by discourse or writing, lose that luminous conception which they have before attained. All accounts agree in ascribing to Cromwell a tiresome, dark, unintelligible elocution, even when he had no intention to disguise his meaning; yet no man's actions were ever, in such a variety of difficult incidents, more decisive and judicious."

The case here described may be considered as an extreme one; but every person of common observation must recollect facts somewhat analogous, which have fallen under his own notice. Indeed, it is no more than we should expect, *à priori*, to meet with, in every individual whose early habits have trained him more to the active business of the world, than to those pursuits which prepare the mind for communicating to others its ideas and feelings with clearness and effect.

An anecdote which I heard many years ago, of a late very eminent Judge, (Lord Mansfield,) has often recurred to my memory, while reflecting on these apparent inconsistencies of intellectual character. A friend of his, who possessed excellent natural talents, but who had been prevented, by his professional duties as a naval officer, from bestowing on them all the cultivation of which they were susceptible, having been recently appointed to the government of Jamaica, happened to express some doubts of his competency to preside in the Court of Chancery. Lord Mansfield assured him that he would find the difficulty not so great as he apprehended. "Trust," he said, "to your own good sense in forming your opinions; but beware of attempting to state the grounds of your judgments. The judgment will probably be right — the argument will infallibly be wrong."

From what has been said, it seems to follow, that although a man should happen to reason ill in support of a sound conclusion, we are by no means entitled to infer with confidence, that he judged right merely by accident. It is far from being impossible, that he may have committed some mistake in stating to others (perhaps in retracing to himself) the grounds upon which his judgment was really founded. Indeed, this must be the case, wherever a shrewd understanding in business is united with an incapacity for clear and luminous reasonings; and something of the same sort is incident, more or less, to all men (more particularly to men of quick parts) when they make an attempt, in discussions concerning human affairs, to remount to first principles. It may be added, that in the old, this correctness of judgment often remains, in a surprising degree, long after the discursive or argumentative power would seem, from some decay of attention, or confusion in the succession of ideas, to have been sensibly impaired by age or by disease.

II. Of general reasoning. *Of language considered as an instrument of thought.* — In treating of *abstraction,* I endeavored to show that we think, as well as speak, by means of words, and that, without the use of language, our reasoning faculty, if it could have been at all exercised, must necessarily have been limited to particular conclusions alone. The effects, therefore, of ambiguous and indefinite terms are not confined to our communications with others, but extend to our private and solitary speculations. Dr. Campbell, in his Philosophy of Rhetoric, has made some judicious and important observations on this subject; and, at a much earlier period, it drew the attention of Des Cartes; who, in the course of a very valuable discussion with respect to the sources of our errors, has laid particular stress on those to which we are exposed from the employment of language as an instrument of thought. "And, lastly, in consequence of the habitual use of speech, all our ideas become associated with the words in which we express them; nor do we ever commit these ideas to memory, without their accustomed signs. Hence it is, that there is hardly any one subject, of which we have so distinct a notion as to be able to think of it abstracted from all use of language; and, indeed, as we remember *words* more easily than *things*, our thoughts are much more conversant with the former than with the latter. Hence, too, it is, that we often yield our assent to propositions, the meaning of which we do not understand; imagining that we have either examined formerly the import of all the terms involved in them, or that we have adopted these terms on the authority of others upon whose judgment we can rely."

To these important considerations, it may be worth while to add, that whatever improvements may yet be made in language by philosophers, they can never relieve the student from the indispensable task of analyzing with accuracy the complex ideas he annexes to the terms employed in his reasonings. The use of *general terms*, as Locke has remarked, is learned, in many cases, before it is possible for us to comprehend their meaning; and the greater part of mankind continue to use them through life, without ever being at the trouble to examine accurately the notions they convey. This is a study which every individual must carry on for himself; and of which no rules of logic (how useful soever they may be in directing our labors) can supersede the necessity.

Necessity of a cautious use of words. — Of the essential utility of a cautious employment of words, both as a medium of communication, and as an instrument of thought, many striking illustrations might be produced from the history of science during the time that the scholastic jargon was current among the learned; a technical phraseology, which was not only ill-calculated for the discovery of truth, but which was dexterously contrived for the propagation of error; and which gave to those who were habituated to the use of it, great advantages in controversy, at least in the judgment of the multitude, over their more enlightened and candid opponents. "A blind wrestler, by fighting in a dark chamber," to adopt an allusion of Des Cartes, "may not only conceal his defect, but may enjoy some advantages over those who see. It is the light of day only that can discover his inferiority." The imperfections of this philosophy, accordingly, have been exposed by Des Cartes and his followers, less by the force of their reasonings, than by their teaching men to make use of their own faculties, instead of groping in the artificial darkness of the schools; and to perceive the folly of expecting to advance science, by ringing changes on words to which they annexed no clear or precise ideas.

In consequence of the influence of these views, the attention of our soundest philosophers was more and more turned, during the course of the last century, to the cultivation of that branch of logic which relates to the use of words. Mr. Locke's observations on this subject form, perhaps, the most valuable part of his writings; and, since his time, much additional light has been thrown upon it by Condillac and his successors.

The art of reasoning requires something besides a language well contrived. — Important, however, as this branch of logic is in its practical applications; and highly interesting, from its intimate connection with the theory of the human mind, there is a possibility of pushing to an erroneous and dangerous extreme the conclusions to which it has led. Condillac himself falls, in no inconsiderable a degree, under this censure; having, upon more than one occasion, expressed himself as if he conceived it to be possible, by means of precise and definite terms, to reduce reasoning in all the sciences to a sort of mechanical operation, analogous in its nature to those which are practised by the algebraist on letters of the alphabet. "The art of reasoning (he repeats over and over) is nothing more than a language well arranged."

One of the first persons, as far as I know, who objected to the vagueness and incorrectness of this proposition, was M. De Gerando; to whom we are further indebted for a clear and satisfactory exposition of the very important fact to which it relates.

"It is the distinguishing characteristic of a lively and vigorous conception," he remarks, "to push its speculative conclusions somewhat beyond their just limits. Hence, in the logical discussions of this estimable writer, these maxims, (stated without any explanation or restriction,) 'That the study of a science is nothing more than the acquisition of a language;' and, 'that a science properly treated, is only a language well contrived.' Hence the rash assertion, 'That mathematics possess no advantage over other sciences, but what they derive from a better phraseology; and that all of these might attain to the same characters of simplicity and of certainty, if we knew how to give them signs equally perfect.'"

"The same task which must have been executed by those who contributed to the first formation of a language, and which is executed by every child when he learns to speak it, is repeated over in the mind of every adult, when he makes use of his mother tongue; for it is only by the decomposition of his thoughts, that he can learn to select the signs which he ought to employ, and to dispose them in a suitable order. Accordingly, those external actions which we call *speaking or writing, are always accompanied with a philosophical process of the understanding*, unless we content ourselves, as too often happens, with repeating over mechanically what has been said by others. It is in this respect that languages, with their forms and rules, conducting (so to speak) those who use them into the path of a regular analysis; tracing out to them, in a well-ordered discourse, the model of a perfect decomposition, may be regarded in a certain sense as analytical methods. But I stop short: Condillac, to whom this idea belongs, has developed it too well to leave any hope of improving upon his statement."

In a note upon this passage, however, M. De Gerando has certainly improved not a little on the statement of Condillac. "In asserting," says he, "that languages may be regarded as analytical methods, I have added the qualifying phrase, *in a certain sense*, for the word *method* cannot be employed here with exact propriety. *Languages furnish the occasions and the means of analysis; that is to say, they afford us assistance in following that method; but they are not the method itself.* They resemble signals or finger-posts placed on a road, to enable us to discover our way; and if they help us to analyze, it is because they are themselves the results, and, as it were, the monuments, of an analysis which has been previously made; nor do they contribute to keep us in the right path, but in proportion to the degree of judgment with which that analysis has been conducted."

Visionary theories of some logicians, occasioned by their inattention to the essential distinction between mathematics and other sciences.—In a passage already quoted from De Gerando, he takes notice of what he justly calls a rash assertion of Condillac, "That mathematics possess no advantage over other sciences, but what they derive from a better phraseology; and that all of these might attain to the same characters of simplicity and of certainty, if we knew how to give them signs equally perfect."

Leibnitz seems to point at an idea of the same sort, in those obscure and enigmatical hints (not altogether worthy, in my opinion, of his powerful and comprehensive genius) which he has thrown out, about the miracles to be effected by a new art of his own invention; to which art he sometimes gives the name of *Ars Combinatoria Characteristica*, and sometimes of *Ars Combinatoria Generalis ac Vera.* In one of his letters to Mr. Oldenburgh, he speaks of a plan he had long been meditating, of treating of the science of mind by means of mathematical demonstrations. "Many wonderful things," he adds, "of this kind have occurred to me; which, at some future period, I shall explain to the public with that logical precision which the subject requires." In the same letter, he intimates his belief in the possibility of inventing an art, "which, with an exactitude resembling that of mechanism, may render the operations of reason steady and visible, and, in their effects on the minds of others, irresistible." After which he proceeds thus: —

"Our common algebra, which we justly value so highly, is no more than a branch of that general art which I have here in view. But such as it is, it puts it out of our power to commit an error, even although we should wish to do so; while it exhibits truth to our eyes like a picture stamped on paper by means of a machine. It must at the same time be recollected, that algebra is indebted for whatever it accomplishes in the demonstration of general theorems to the suggestions of a higher science; a science which I have been accustomed to call *characteristical combination;* very different, however, in its nature, from that which these words are likely at first to suggest to the hearer. The marvellous utility of this art I hope to illustrate, both by precepts and examples, if I shall be so fortunate as to enjoy health and leisure.

"It is impossible for me to convey an adequate idea of it in a short description. But this I may venture to assert, that no instrument (or organ) could easily be imagined of more powerful efficacy for promoting the improvement of the human understanding; and that, supposing it to be adopted, as the common method of philosophizing, the time would very soon arrive, when we should be able to form conclusions concerning God and the mind, with not less certainty than we do at present concerning figures and numbers."

How the phraseology of mathematics differs from that of the other sciences. — In these extracts from Leibnitz, as well as in that quoted from Condillac, in the beginning of this article, the essential distinction between mathematics and the other sciences, in point of phraseology, is entirely overlooked. In the *former* science, where *the use of an ambiguous word is impossible*, it may be easily conceived how the solution of a problem may be reduced to something resembling the operation of a mill — the conditions of the problem, when once translated from the common language into that of algebra, disappearing entirely from the view; and the subsequent process being almost mechanically regulated by general rules, till the final result is obtained. In the *latter*, the whole of *the words* about which our reasonings are conversant, *admit, more or less, of different shades of meaning;* and it is only by considering attentively the relation in which they stand to the immediate context, that the precise idea of the author in any particular instance is to be ascertained. *In these sciences*, accordingly, *the constant and unremitting exercise of the attention is indispensably necessary*, to prevent us, at every step of our progress, from going astray. In following any train of reasoning, beyond the circle of the mathematical sciences, the mind must necessarily carry on, along with the logical deduction expressed in words, *another logical process* of a far nicer and more difficult nature; — *that of fixing*, with a rapidity which escapes our memory, *the precise sense of every word which is ambiguous*, by the relation in which it stands to the general scope of the argument. In proportion as the language of science becomes more and more exact, the difficulty of this task will be gradually diminished; but let the improvement be carried to any conceivable extent, not one step will have been gained in accelerating that era, so sanguinely anticipated by Leibnitz and Condillac, when our reasonings in morals and politics shall resemble, in their mechanical regularity, and in their demonstrative certainty, the investigations of algebra. The improvements which language receives, in consequence of the progress of knowledge, consisting rather *in a more precise distinction and classification of the various meanings of words, than in a reduction of these meanings in point of number*, the task of mental induction and interpretation may be rendered more easy and unerring; but the necessity of this task can never be superseded, till every word which we employ shall be as fixed and invariable in its signification as an algebraical character or as the name of a geometrical figure.

Successful study of the moral sciences depends on the right interpretation of words.—In the mean time, the intellectual superiority of one man above another, in all the different branches of moral and political philosophy, will be found to depend chiefly on the success with which he has cultivated *these silent habits of inductive interpretation*—much more, in my opinion, than on his acquaintance with those rules which form the great objects of study to the professed logician. In proof of this, it is sufficient for me to remind my readers, that *the whole theory of syllogism proceeds on the supposition that the same word is always to be employed precisely in the same sense*, (for otherwise, the syllogism would be vitiated by consisting of more than three terms); and, consequently, it takes for granted, in every rule which it furnishes for the guidance of our reasoning powers, that the nicest and by far the most difficult part of the logical process has been previously brought to a successful termination.

In treating of a different question, I have elsewhere remarked, that although many authors have spoken of the wonderful mechanism of speech, no one has hitherto attended to the far more wonderful mechanism which it puts into action behind the scene. A similar observation will be found to apply to what is commonly called *the art of reasoning.* The scholastic precepts which profess to teach it, reach no deeper than the very surface of the subject; being all of them confined to that part of the intellectual process which is embodied in the form of verbal propositions. On the most favorable supposition which can be formed with respect to them, they are superfluous and nugatory; but in many cases, it is to be apprehended, that they interfere with the right conduct of the understanding, by withdrawing the attention from the cultivation of that *mental logic* on which the soundness of our conclusions essentially depends, and in the study of which, although some general rules may be of use, every man must be, in a great measure, his own master.

Why general speculation seems intricate.—In the practical application of the foregoing conclusions, it cannot fail to occur, as a consideration equally obvious and important, that, in proportion as the objects of our reasoning are removed from the particular details with which our senses are conversant, the difficulty of these latent inductive processes must be increased. This is the real source of that incapacity for general speculation, which Mr. Hume has so well described as a distinguishing characteristic of uncultivated minds. "General reasonings seem intricate, merely because they are general; nor is it easy for the bulk of mankind to distinguish, in a great number of particulars, that common circumstance in which they all agree, or to extract it, pure and unmixed, from the other superfluous circumstances. Every judgment or conclusion with them is particular. They cannot enlarge their views to those universal propositions, which comprehend under them an infinite number of individuals, and include a whole science in a single theorem. Their eye is confounded with such an extensive prospect, and the conclusions deduced from it, even though clearly expressed, seem intricate and obscure."

Difficult, however, and even impossible, as the task of general speculation is to the bulk of mankind, it is nevertheless true, that it is the path which leads the cautious and skilful reasoner to all his most certain, as well as most valuable, conclusions in morals and in politics. If a theorist, indeed, should expect, that these conclusions are in every particular instance to be realized, he would totally misapprehend their nature and application; inasmuch as they are only to be brought to an experimental test, by viewing them on an extensive scale, and continuing our observations during a long period of time. "When a man deliberates," says Mr. Hume, "concerning his conduct *in any particular affair*, and forms schemes in politics, trade, economy, or any business in life, he never ought to draw his arguments too fine, or connect too long a chain of consequences together. Something is sure to happen that will disconcert his reasoning, and produce an event different from what he expected. But when we reason *upon general subjects*, one may justly affirm, that our speculations can scarcely ever be too fine, provided they be just; and that the difference between a common man and a man of genius, is chiefly seen in the shallowness or depth of the principles on which they proceed." The same author afterwards excellently observes, "That general principles, however intricate they may seem, must always prevail, if they be just and sound, in the general course of things, though they may fail in particular cases; and that it is the chief business of philosophers to regard the general course of things." — "I may add," continues Mr. Hume, "that it is also the chief business of politicians, especially in the domestic government of the state, where the public good, which is, or ought to be, their object, depends on the concurrence of a multitude of causes; not, as in foreign politics, on accidents and chances, and the caprices of a few persons."

Why general rules sometimes mislead us. — To these profound reflections of Mr. Hume, it may be added, although the remark does not bear directly on our present argument, that, in the systematical application of general and refined rules to their private concerns, men frequently err *from calculating their measures on a scale disproportionate to the ordinary duration of human life.* This is one of the many mistakes into which projectors are apt to fall: and hence the ruin which so often overtakes them, while sowing the seeds of a harvest which others are to reap. A few years more might have secured to themselves the prize which they had in view; and changed the opinion of the world, (which is always regulated by the accidental circumstances of failure or of success,) from contempt of their folly, into admiration of their sagacity and perseverance.

It is observed by the Comte de Bussi, that "time remedies all mischances; and that men die unfortunate, only because they did not live long enough. Mareschal d'Estrée, who died rich at a hundred, would have died a beggar, had he lived only to eighty." The maxim, like most other apophthegms, is stated in terms much too unqualified; but it may furnish matter for many interesting reflections, to those who have surveyed with attention the characters which have passed before them on the stage of life; or who amuse themselves with marking the trifling and fortuitous circumstances by which the multitude are decided, in pronouncing their verdicts of foresight or of improvidence.

III. OF MATHEMATICAL DEMONSTRATION. *Of the circumstance on which demonstrative evidence essentially depends.*— The peculiarity of that species of evidence which is called demonstrative, and which so remarkably distinguishes our mathematical conclusions from those to which we are led in other branches of science, is a fact which must have arrested the attention of every person who possesses the slightest acquaintance with the elements of geometry. And yet I am doubtful if a satisfactory account has been hitherto given of the circumstance from which it arises. Mr. Locke tells us, that "what constitutes a demonstration is *intuitive evidence at every step;*" and I readily grant, that if in a single step such evidence should fail, the other parts of the demonstration would be of no value. It does not, however, seem to me that it is on this consideration that the demonstrative evidence of the conclusion depends,— not even when we add to it another which is much insisted on by Dr. Reid,—that, "in demonstrative evidence, our *first prinples must be intuitively certain.*" The inaccuracy of this remark I formerly pointed out, when treating of the evidence of axioms; on which occasion I also observed, that the first principles of our reasonings in mathematics are not axioms, but definitions. It is in this last circumstance (I mean *the peculiarity of reasoning from definitions*) that the true theory of mathematical demonstration is to be found; and I shall accordingly endeavor to explain it at considerable length, and to state some of the more important consequences to which it leads.

It was already remarked in the eighth chapter, that whereas, in all other sciences, the propositions which we attempt to establish, express facts real or supposed,—*in mathematics, the propositions which we demonstrate only assert a connection between certain suppositions and certain consequences.* Our reasonings, therefore, in mathematics, are directed to an object essentially different from what we have in view, in any other employment of our intellectual faculties; — *not to ascertain truths with respect to actual existences,* but to trace *the logical filiation of consequences* which follow *from an assumed hypothesis.* If from this hypothesis we reason with correctness, nothing, it is manifest, can be wanting to complete the evidence of the result; as this result only asserts a necessary connection between the supposition and the conclusion. In the other sciences, admitting that every ambiguity of language were removed, and that every step of our deductions were rigorously accurate, our conclusions would still be attended with more or less of uncertainty; being ultimately founded on principles which may, or may not, correspond exactly with the fact.

Demonstrative reasoning might be employed in the moral sciences. — Hence, it appears, that it might be possible, by devising a set of *arbitrary definitions,* to form a science which, although conversant about moral, political, or physical ideas, should yet be as certain as geometry. It is of no moment, *whether the definitions assumed correspond with facts or not,* provided they do not express impossibilities, and be not inconsistent with each other. From these principles a series of consequences may be deduced, by the most unexceptionable reasoning; and the results obtained will be perfectly analogous to mathematical propositions. The terms *true* and *false* cannot be applied to them; at least, in the sense in which they are applicable to propositions relative to facts. All that can be said is, that they are, or are not, connected with the definitions which form the principles of the science; and, therefore, if we choose to call our conclusions true in the one case, and false in the other, these epithets must be understood *merely to refer to their connection with the data,* and not to their correspondence with things actually existing, or with events which we expect to be realized in future. An example of such a science as that which I have now been describing, occurs in what has been called by some writers *theoretical mechanics;* in which, from arbitrary hypotheses concerning physical laws, the consequences are traced which would follow, if such was really the order of nature.

In those branches of study which are conversant about moral and political propositions, the nearest approach which I can imagine to a *hypothetical* science, analogous to mathematics, is to be found in a code of municipal *jurisprudence;* or rather, might be conceived to exist in such a code, if systematically carried into execution, agreeably to certain general or fundamental principles. Whether these principles should, or should not, be founded in justice and expediency, it is evidently possible, by reasoning from them consequentially, to create *an artificial or conventional body of knowledge, more systematical, and,* at the same time, *more complete* in all its parts, than, in the present state of our information, any science can be rendered, which ultimately appeals to the eternal and immutable standards of truth and falsehood, of right and wrong. This consideration seems to me to throw some light on the following very curious parallel which Leibnitz has drawn, with what justness I presume not to decide, between the works of the Roman civilians and those of the Greek geometers. Few writers certainly have been so fully qualified as he was, to pronounce on the characteristical merits of both.

"I have often said, that, after the writing of geometricians, there exists nothing which, in point of force and of subtilty, can be compared to the works of the Roman lawyers. And, as it would be scarcely possible, from mere intrinsic evidence, to distinguish a demonstration of Euclid's from one of Archimedes or of Apollonius, (the style of all of them appearing no less uniform than if reason herself was speaking through their organs,) so also the Roman lawyers all resemble each other like twin-brothers; insomuch that, from the style alone of any particular opinion or argument, hardly any conjecture could be formed with respect to the author. Nor are the traces of a refined and deeply meditated system of natural jurisprudence anywhere to be found more visible, or in greater abundance. And, even in those cases where its principles are departed from, either in compliance with the language consecrated by technical forms, or in consequence of new statutes, or of ancient traditions, the conclusions which the assumed hypothesis renders it necessary to incorporate with the external dictates of right reason, are deduced with the soundest logic, and with an ingenuity which excites admiration. Nor are these deviations from the law of nature so frequent as is commonly imagined."

I have quoted this passage merely as an illustration of the analogy already alluded to, between the systematical unity of mathematical science, and that which is *conceivable* in a system of municipal law. How far this unity is exemplified in the Roman code, I leave to be determined by more competent judges.

The evidence of the senses not applicable in mathematics. — As something analogous to the hypothetical or conditional conclusions of mathematics may thus be fancied to take place in speculations concerning moral or political subjects, and actually does take place in theoretical mechanics; so, on the other hand, if a mathematician should affirm, of a general property of the circle, that it applies *to a particular figure described on paper*, he would at once degrade a geometrical theorem to the level of a fact resting ultimately on the evidence of our imperfect senses. The accuracy of his reasoning could never bestow on his proposition that peculiar evidence which is properly called mathematical, as long as the fact remained uncertain, whether all the straight lines drawn from the centre to the circumference of the figure were mathematically equal.

Precision in the use of words is not the sole characteristic of demonstrative reasoning. — These observations lead me to remark a very common misconception concerning *mathematical definitions;* which are of a nature essentially different from the definitions employed in any of the other sciences. It is usual for writers on logic, after taking notice of the errors to which we are liable in consequence of the ambiguity of words, to appeal to the example of mathematicians, as a proof of the infinite advantage of using, in our reasonings, such expressions only as have been carefully defined. Various remarks to this purpose occur in the writings both of Mr. Locke and of Dr. Reid. But the example of mathematicians is by no means applicable to the science in which these eminent philosophers propose that it should be followed; and, indeed, if it were copied as a model in any other branch of human knowledge, it would lead to errors fully as dangerous as any which result from the imperfections of language. The real fact is, that it has been copied much more than it ought to have been, or than would have been attempted, if the peculiarities of mathematical evidence had been attentively considered.

That in mathematics there is no such thing as an ambiguous word, and that it is to the proper use of definitions we are indebted for this advantage, must unquestionably be granted. But this is an advantage easily secured, in consequence of *the very limited vocabulary of mathematicians, and the distinctness of the ideas about which their reasonings are employed.* The difference, besides, in this respect, between mathematics and the other sciences, however great, is yet only a difference in degree; and is by no means sufficient to account for the essential distinction, which every person must perceive between the irresistible cogency of a mathematical demonstration and that of any other process of reasoning.

Proper use of definitions. — From the foregoing considerations it appears, that in mathematics, definitions answer *two* purposes; *first, to prevent ambiguities of language;* and, *secondly, to serve as the principles of our reasoning.* It appears further, that it is to the latter of these circumstances, (I mean to *the employment of hypotheses instead of facts*, as the data on which we proceed,) that the peculiar force of demonstrative evidence is to be ascribed.* It is, however, only in the former

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* [Mr. Stewart shows with sufficient clearness, that the definitions are the true premises of mathematical reasoning, and that it is only upon the supposition or hypothesis of these definitions being granted, that the reasoning holds good. But he does not show very clearly *why* the employment of definitions and hypotheses should give to a mathematical demonstration the irresistible cogency which distinguishes it from every other species of reasoning. In another work, the editor of this volume has endeavored to supply this defect by the following considerations.

Demonstrative reasoning is employed exclusively about *the relations of ideas*, or *abstract ideas*, and its conclusions are always abstract; the inducuse of definitions, that any parallel can be drawn between mathematics and those branches of knowledge which relate to facts; and, therefore, it is not a fair argument in proof of their general utility, to appeal to the unrivalled certainty of mathematical science, — a preëminence which that science derives from a source altogether different, though comprehended under the same name, and which she will forever claim as her own exclusive prerogative.

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tive sciences relate exclusively to *matters of fact*. The relations of ideas, — that is, of abstractions, or pure ideas, are made known to us by intuition or reflection. They are pure creations of the intellect; in their uncompounded or abstract character, they are not derived from observation, and are therefore not perverted by that great source of error, the imperfection of the senses, or the limitations of our power of perception. When we entertain these ideas, or reason about them, the mind is closed to all outward impressions, and freed even from the memory of their former occurrence. The ideas that are contemplated then, are contemplated in their entireness; for, being uncompounded, if they are apprehended at all, they must be perfectly apprehended, and, consequently, the relations between them are discerned at once, or by intuition. The office of the definition is to shut out the consideration of those qualities which are not included in the definition, because they are imperfectly known. Our attention being thus *confined to what we know perfectly*, the reasoning proceeds without any possibility of error. All the conclusions of pure mathematics, pure logic, and pure reason, are metaphysical truths, and we can no more doubt them than we can question the accuracy of the multiplication table.

When we come to investigate *matters of fact*, or to reason about them, we enter upon totally different ground. Instead of abstractions, we have realities; instead of shutting out sensible evidence altogether, we are obliged to rely upon it exclusively; instead of intuitions, we have observations and experiments; instead of demonstration, we have induction; instead of the objects of inquiry being perfectly simple and uncompounded, they are made up of an unknown and unknowable number of elements and qualities. The imperfections of the senses come in here, to their full extent, as causes of possible error. The objects of physical science must always be *imperfectly known*; we never can be sure that our analysis of them is perfect, or that our observation has taken in all their outward qualities. The attractive power of the loadstone was known for centuries before its polarity was discovered. Down to the times of Watt and Cavendish, water was supposed to be a simple element, and it figures

Nor ought it to be forgotten, that it is in pure mathematics alone, that definitions can be attempted with propriety at the outset of our investigations. In most *other* instances, some previous discussion is necessary to show, that *the definitions* which we lay down *correspond with facts;* and, in many cases, the

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as such in some of the ancient theories of cosmogony; these chemists, about a century ago, discovered that it was compounded of two gases. The chemist will tell you that it is not impossible, that it is even probable, that every one of the sixty substances now counted as elementary, will ultimately be decomposed. Of course, the vast number of compounded objects of which natural history takes cognizance, are still more imperfectly known in their qualities and relations, than those substances which as yet are reckoned elementary. This limited acquaintance with the subjects of investigation must lead only to qualified, and, in the logical meaning of the term, uncertain, conclusions respecting them.

Pure logic and pure mathematics are not so much sciences, as methods of scientific inquiry, or *organa* of investigation and proof. They are modes of reasoning, irrespective of the subjects or facts about which we reason, and therefore applicable to all subjects. In the syllogism, for instance, the conclusion follows with absolute certainty from the premises, the truth of the premises being presupposed; whether this truth rests upon sensible evidence, or intuition, or a previous demonstration, is of no consequence. The principles of the syllogism, then, are pure abstractions; and the letters of the alphabet, or purely arbitrary marks, taken as signs of any ideas or facts whatsoever, are the most convenient notation for expressing them. If the premises are matters of fact, or contingent truth, the conclusion will also be a matter of fact, or contingent truth; only the relation between the premises and conclusion is a metaphysical truth, and as such is made known by intuition.

The case is perfectly similar with mathematics, in which we employ a notation of the same sort. In its pure form, this science proceeds from abstraction to abstraction, the truth developed by it having no foundation in *fact,* and never being exemplified in the external world. If an event in the physical world, or a proposition founded on experience, be taken as a *datum,* or point of departure for the inquiry, however long the chain of mathematical reasoning may be which proceeds from it, the result at which we arrive, is a truth of the same order with the one which formed the basis of the investigation. It has lost nothing, and it has gained nothing, in point of logical certainty, through the process to which it has been subjected. — *Lowell Lectures on Metaphysical and Ethical Science.* Lecture I.]

formation of a just definition is the end to which our inquiries are directed. It is very judiciously observed by Mr. Burke, in his Essay on Taste, that "when we define, we are in danger of circumscribing nature within the bounds of our own notions, which we often take up by hazard, or embrace on trust, or form out of a limited and partial consideration of the object before us, instead of extending our ideas to take in all that nature comprehends, according to her manner of combining. We are limited in our inquiry by the strict laws to which we have submitted at our setting out."

The same author adds, that "a definition may be very exact, and yet go but a very little way towards informing us of the nature of the thing defined;" and that, "in the order of things, a definition, let its virtue be what it will, ought rather to follow than to precede our inquiries, of which it ought to be considered as the result."

From a want of attention to these circumstances, and from a blind imitation of the mathematical arrangement in speculations where facts are involved among the principles of our reasonings, numberless errors in the writings of philosophers might be easily traced. The subject is of too great extent to be pursued any further here; but it is well entitled to the examination of all who may turn their thoughts to the reformation of logic. That the ideas of Aristotle himself, with respect to it, were not very precise, must, I think, be granted, if the following statement of his ingenious commentator be admitted as correct.

Definitions in geometry are not founded on observation.—"Every general term," says Dr. Gillies, "is considered by Aristotle, as the abridgment of a definition; and every definition is denominated by him a collection, because it is the result always of observation and comparison, and often of many observations and of many comparisons."

These two propositions will be found, upon examination, not very consistent with each other. The first, "That every general term is the abridgment of a definition," applies, indeed, admirably to mathematics; and touches with singular precision on the very circumstance which constitutes, in my opinion, the peculiar cogency of mathematical reasoning. But it is to mathematics that it applies exclusively. If adopted as a logical maxim in other branches of knowledge, it would prove an endless source of sophistry and error.—The second proposition, on the other hand, "That every definition is the result of observation and comparison, and often of many observations and many comparisons," however applicable to the definitions of natural history, and of other sciences which relate to facts, cannot, in one single instance, apply to the definitions of geometry; inasmuch as these definitions are the result neither of observations nor of comparisons, but are the hypotheses, or first principles, on which the whole science rests.

If the foregoing account of demonstrative evidence be just, it follows, that *no chain of reasoning whatever can deserve the name of a demonstration,* (at least in the mathematical sense of that word) *which is not ultimately resolvable into hypotheses or definitions.** It has been already shown, that this is the case with geometry. And it is also manifestly the case with arithmetic, another science to which, in common with geometry, we apply the word mathematical. The simple arithmetical equations 2 add 2 = 4; 2 add 3 = 5, and other elementary propositions of the same sort, are, as was formerly observed, mere definitions, perfectly analogous, in this respect, to those at the beginning of Euclid; and it is from a few fundamental principles which are essentially of the same description, that all the more complicated results in the science are derived.

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* Although the account given by Locke of what constitutes a demonstration, be different from that which I have here proposed, he admits the converse of this doctrine as manifest; viz. That if we reason accurately from our own definitions, our conclusions will possess demonstrative evidence; and "hence" he observes with great truth, "it comes to pass, that one may often meet with very clear and coherent discourses, that amount yet to nothing." He afterwards remarks, that, "one may make demonstrations and undoubted propositions in words, and yet thereby advance not one jot in the knowledge of the truth of things." "Of this sort," he adds, "a man may find an infinite number of propositions, reasonings, and conclusions, in books of metaphysics, school-divinity, and some sort of natural philosophy; and, after all, know as little of God spirits or bodies, as he did before he set out."

The problems of geometry are as hypothetical as its theorems. — To this general conclusion, with respect to the nature of mathematical demonstration, an exception may perhaps be, at first sight, apprehended to occur, in our reasonings concerning geometrical *problems;* all of these reasonings, as is well known, resting ultimately upon a particular class of principles called *postulates*, which are commonly understood to be so very nearly akin to *axioms*, that both might, without impropriety, be comprehended under the same name. "The definition of a *postulate*," says the learned and ingenious Dr. Hutton, "will nearly agree also to an axiom, which is a self-evident theorem, as a postulate is a self-evident problem." The same author, in another part of his work, quotes a remark from Dr. Barrow, that "there is the same affinity between postulates and problems, as between axioms and theorems."

In opposition to these very high authorities, I have no hesitation to assert, that it is *with the definitions* of Euclid, and *not with the axioms, that the postulates ought to be compared*, in respect of their logical character and importance; — inasmuch as all the demonstrations in plane geometry are ultimately founded on the former, and all the constructions which it recognizes as legitimate, may be resolved ultimately into the latter. To this remark it may be added, that, according to Euclid's view of the subject, *the problems* of geometry *are not less hypothetical and speculative*, (or, to adopt the phraseology of some late writers, not less objects of pure reason,) *than the theorems;* the possibility of drawing a mathematical straight line, and of describing a mathematical circle, being assumed in the construction of every problem, in a way quite analogous to that in which the enunciation of a theorem assumes the existence of straight lines, and of circles corresponding to their mathematical definitions. The reasoning, therefore, on which the solution of a problem rests, is not less demonstrative than that which is employed in proof of a theorem. Grant the possibility of the three operations described in the postulates, and the correctness of the solution is as mathematically certain, as the truth of any property of the triangle or of the circle. The three postulates of Euclid are, indeed, nothing more than the definition of a circle and a straight line thrown into a form somewhat different; and a similar remark may be extended to the corresponding distribution of propositions into theorems and problems. Notwithstanding the many conveniences with which this distribution is attended, it was evidently a matter of choice rather than of necessity; all the truths of geometry easily admitting of being moulded into either shape, according to the fancy of the mathematician. As to the axioms, there cannot be a doubt, whatever opinion may be entertained of their utility or of their insignificance, that they stand precisely in the same relation to both classes of propositions.

How far it is true that all mathematical evidence is resolvable into identical propositions. — I had occasion to take notice, in the first section of the preceding chapter, of a theory with respect to the nature of mathematical evidence, very different from that which I have been now attempting to explain. According to this theory (originally, I believe, proposed by Leibnitz) we are taught, that all mathematical evidence ultimately resolves into the perception of identity; the innumerable variety of propositions which have been discovered, or which remain to be discovered in the science, being only diversified expressions of the simple formula, $a = a$.

As this account of mathematical evidence is quite irreconcilable with the scope of the foregoing observations, it is necessary, before proceeding further, to examine its real import and amount; and what the circumstances are from which it derives that plausibility which it has been so generally supposed to possess.

Ideal superposition is the only way of proving that one space is equal to another. — That all mathematical evidence resolves ultimately into the perception of identity, has been considered by some as a consequence of the commonly received doctrine, which represents the axioms of Euclid as the first principles of all our subsequent reasonings in geometry. Upon this view of the subject, I have nothing to offer in addition to what I have already stated. The argument which I mean to combat at present, is of a more subtile and refined nature; and, at the same time, involves an admixture of important truth, which contributes not a little to the specious verisimilitude of the conclusion. It is founded on this simple consideration, that *the geometrical notions of equality and of coincidence are the same;* and that, even in comparing together spaces of different figures, all our conclusions ultimately lean with their whole weight on the imaginary application of one triangle to another; — the object of which imaginary application is merely to identify the two triangles together in every circumstance connected both with magnitude and figure.*

Of the justness of the assumption on which this argument proceeds, I do not entertain the slightest doubt. Whoever has the curiosity to examine any one theorem in the elements of plane geometry, in which different spaces are compared together, will easily perceive, that the demonstration, when traced back to its first principles, terminates in the fourth proposition of Euclid's first book; a proposition of which the proof rests entirely on a supposed application of the one triangle to the other. In the case of equal triangles which differ in figure, this expedient of ideal superposition cannot be directly and immediately employed to evince their equality; but the demonstration will nevertheless be found to rest at bottom on the same species of evidence. In illustration of this doctrine, I shall only appeal to the thirty-seventh proposition of the first book, in which it is proved that *triangles on the same base, and between*

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* It was probably with a view to the establishment of this doctrine, that some foreign elementary writers have lately given the name of *identical triangles* to such as agree with each other both in sides, in angles, and in area. The differences which may exist between them in respect of place, and of relative position (differences which do not at all enter into the reasonings of the geometer) seem to have been considered as of so little account in discriminating them as separate objects of thought, that it has been concluded they only form one and the same triangle, in the contemplation of the logician.

the same parallels, are equal; a theorem which appears, from a very simple construction, to be only a few steps removed from the fourth of the same book, in which the supposed application of the one triangle to the other, is the only medium of comparison from which their quality is inferred.

In general, it seems to be almost self-evident, that the equality of two spaces can be demonstrated only by showing, either that the one might be applied to the other, so that their boundaries should exactly coincide; or that it is possible, by a geometrical construction, *to divide them into compartments,* in such a manner, that *the sum of parts in the one may be proved to be equal to the sum of parts in the other, upon the principle of superposition.* To devise the easiest and simplest constructions for attaining this end, is the object to which the skill and invention of the geometer is chiefly directed.

Nor is it the geometer alone who reasons upon this principle. If you wish to convince a person of plain understanding, who is quite unacquainted with mathematics, of the truth of one of Euclid's theorems, it can only be done by exhibiting to his eye operations exactly analogous to those which the geometer presents to the understanding. A good example of this occurs in the sensible or experimental illustration which is sometimes given of the forty-seventh proposition of Euclid's first book. For this purpose, a card is cut into the form of a right angled triangle, and square pieces of card are adapted to the different sides; after which, by a simple and ingenious contrivance, the different squares are so dissected, that those of the two sides are made to cover the same space with the square of the hypothenuse. In truth, *this mode of comparison by a superposition, actual or ideal, is the only test of equality which it is possible to appeal to;* and it is from this, as seems from a passage in Proclus to have been the opinion of Apollonius, that, in point of logical rigor, the definition of geometrical equality should have been taken.* The subject is discussed at great length and with much acuteness, as well as learning, in one of the mathematical lectures of Dr. Barrow; to which I must refer those readers who may wish to see it more fully illustrated.

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* I do not think, however, that it would be fair, on this account, to censure Euclid for the arrangement which he has adopted, as he has thereby

Identity and equality are not convertible terms. — I am strongly inclined to suspect, that most of the writers who have maintained that all mathematical evidence resolves ultimately into the perception of identity have had a secret reference in their own minds to the doctrine just stated; and that they have imposed on themselves, by using the words *identity and equality as literally synonymous and convertible terms.* This does not seem to be at all consistent, either in point of expression or of fact, with sound logic. When it is affirmed, for instance, that "if two straight lines in a circle intersect each other, the rectangle contained by the segments of the one is equal to the rectangle contained by the segments of the other;" can it with any propriety be said, that the relation between these rectangles may be expressed by the formula $a = a$? Or, to take a case yet

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most ingeniously and dexterously tried to keep out of the view of the student some very puzzling questions, to which it is not possible to give a satisfactory answer till a considerable progress has been made in the elements. When it is stated in the form of a self-evident truth, that magnitudes which coincide, or which exactly fill the same space, are equal to one another, the beginner readily yields his assent to the proposition; and this assent, without going any further, is all that is required in any of the demonstrations of the first six books; whereas, if the proposition were converted into a definition, by saying, "Equal magnitudes are those which coincide, or which exactly fill the same space;" the question would immediately occur, Are no magnitudes equal but those to which this test of equality can be applied? Can the relation of equality not subsist between magnitudes which differ from each other in figure? In reply to this question, it would be necessary to explain the definition, by adding, That those magnitudes likewise are said to be equal, which are capable of being divided or dissected in such a manner, that the parts of the one may severally coincide with the parts of the other; a conception much too refined and complicated for the generality of students at their first outset; and which, if it were fully and clearly apprehended, would plunge them at once into the profound speculation concerning the comparison of rectilinear with curvilinear figures.

stronger, when it is affirmed, that "the area of a circle is equal to that of a triangle having the circumference for its base, and the radius for its altitude;" would it not be an obvious paralogism to infer from this proposition, that the triangle and the circle are one and the same thing? In this last instance, Dr. Barrow himself has thought it necessary, in order to reconcile the language of Archimedes with that of Euclid, to have recourse to a scholastic distinction between *actual* and *potential* coincidence; and, therefore, if we are to avail ourselves of the principle of superposition, in defence of the fashionable theory concerning mathematical evidence, we must, I apprehend, introduce a correspondent distinction between *actual* and *potential identity.*

That I may not be accused, however, of misrepresenting the opinion which I am anxious to refute, I shall state it in the words of an author, who has made it the subject of a particular dissertation; and who appears to me to have done as much justice to his argument as any of its other defenders.

["All mathematical propositions are identical, and may be represented by this formula, $a = a$. They are identical truths, expressed in various forms, or rather they are what is called the *principle of contradiction* itself,* variously enunciated and involved; as, indeed, all propositions of this sort are really involved in this principle. According to our way of understanding, such propositions differ from each other only in this, that some of them are reduced to the principle of contradiction, and resolved into it, by a long train of reasoning, others by a shorter one. Thus, for example, the proposition $2 + 2 = 4$ is resolved immediately into this, $1 + 1 + 1 + 1 = 1 + 1 + 1 + 1$; that is, *the same is the same;* and, properly speaking, it ought to be thus enunciated, — if four things exist, then four things exist. For geometricians do not treat of existence directly, but it is introduced only by way of hypothesis. Hence the highest degree of certainty results to one who examines such reasoning; for he observes the identity of two ideas; and this is the evidence compelling our immediate assent, which we call mathematical or geometrical evidence. Yet such evidence is not peculiar to mathematical science alone, for it arises from the perception of identity, and the identity of two ideas may be recognized, though they do not represent extension."]

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* [*The principle of contradiction* is the axiom, that "it is impossible for the same thing to be and not to be at the same moment."]

Truths must be distinguished from the evidence by which they are supported. — With respect to this passage I have only to remark, (and the same thing is observable of every other attempt which has been made to support the opinion in question,) that the author confounds two things essentially different; — the nature of the truths which are the objects of a science, and the nature of the evidence by which these truths are established. Granting, for the sake of argument, that all mathematical propositions may be represented by the formula $a=a$, it would not, therefore, follow, *that every step of the reasoning leading to these conclusions, was a proposition of the same nature;* and that, to feel the full force of a mathematical demonstration, it is sufficient to be convinced of this maxim, that every thing may be truly predicated of itself; or, in plain English, that *the same is the same.* A paper written in cipher, and the interpretation of that paper by a skilful decipherer, may, in like manner, be considered as, to all intents and purposes, one and the same thing. They are so, in fact, just as much as one side of an algebraical equation is the same thing with the other. But does it therefore follow, that the whole evidence upon which the art of deciphering proceeds, resolves into the perception of identity?

It may be fairly questioned, too, whether it can, with strict correctness, be said even of the simple arithmetical equation $2+2=4$, that it may be represented by the formula $a=a$. The one is a proposition asserting *the equivalence of two different expressions;* — to ascertain which equivalence may, in numberless cases, be an object of the highest importance. The other is altogether unmeaning and nugatory, and cannot, by any possible supposition, admit of the slightest application of a practical nature. What opinion, then, shall we form of the proposition $a=a$, when considered as the representative of such a formula as the binomial theorem of Sir Isaac Newton? When applied to the equation $2 + 2 = 4$, (which, from its extreme simplicity and familiarity, is apt to be regarded in the light of an axiom,) the paradox does not appear to be so manifestly extravagant; but, in the other case, it seems quite impossible to annex to it any meaning whatever.

The doctrine of Condillac respecting all sorts of evidence controverted. — I should scarcely have been induced to dwell so long on this theory of Leibnitz concerning mathematical evidence, if I had not observed among some late logicians, (particularly among the followers of Condillac), a growing disposition to extend it to all the different sorts of evidence resulting from the various employments of our reasoning powers. Condillac himself states his own opinion on this point with the most perfect confidence. [" The evidence of reason consists altogether in identity, as we have demonstrated. This truth must be very simple to have escaped the notice of all the philosophers, who are so much interested in establishing the grounds of the evidence which they are incessantly talking about."]

The demonstration here alluded to, is extremely concise; and if we grant the two data on which it proceeds, must be universally acknowledged to be irresistible. The first is, " That the evidence of every mathematical equation is that of identity:" the second, " That what are called, in the other sciences, propositions or judgments, are, at bottom, precisely of the same nature with equations." — But it is proper, on this occasion, to let our author speak for himself.

[" But it will be said, that we reason in this way in mathematics, where the reasoning is expressed in equations; but will it be so in the other sciences, where the reasoning is stated in propositions? I answer, that equations, propositions, and judgments are at bottom the same thing, and consequently, that we reason in the same manner in all the sciences."]

Upon this demonstration I have no comment to offer. The truth of the first assumption has been already examined at sufficient length; and the second (which is only Locke's very erroneous account of judgment, stated in terms incomparably more exceptionable,) is too puerile to admit of refutation. It is melancholy to reflect, that a writer, who, in his earlier years, had so admirably unfolded the mighty influence of language upon our speculative conclusions, should have left behind him, in one of his latest publications, so memorable an illustration of his own favorite doctrine.

It was manifestly with a view to the more complete establishment of the same theory, that Condillac undertook a work, which has appeared since his death, under the title of *La Langue des Calculs;* and which, we are told by the editors, was only meant as a prelude to other labors, more interesting and more difficult. From the circumstances which they have stated, it would seem that the intention of the author was to extend to all the other branches of knowledge, inferences similar to those which he has here endeavored to establish with respect to mathematical calculations; and much regret is expressed by his friends, that he had not lived to accomplish a design of such incalculable importance to human happiness. I believe I may safely venture to assert, that it was fortunate for his reputation he proceeded no further; as the sequel must, from the nature of the subject, have afforded, to every competent judge, an experimental and palpable proof of the vagueness and fallaciousness of those views by which the undertaking was suggested. In his posthumous volume, the mathematical precision and perspicuity of his details appear to a superficial reader to reflect some part of their own light on the general reasonings with which they are blended; while to better judges, these reasonings come recommended with many advantages and with much additional authority, from their coincidence with the doctrines of the Leibnitzian school.

Condillac's doctrine anticipated by Hobbes. — It would probably have been not a little mortifying to this most ingenious and respectable philosopher, to have discovered, that, in attempting to generalize a very celebrated theory of Leibnitz, he had stumbled upon an obsolete conceit, started in this island upwards of a century before. "When a man reasoneth," says Hobbes, "he does nothing else but conceive a sum total, from addition of parcels; or conceive a remainder from subtraction of one sum from another; which, if it be done by words, is conceiving of the consequence of the names of all the parts to the name of the whole; or from the name of the whole and one part, to the name of the other part. These operations are not incident to number only, but to all manner of things that can be added together, and taken one out of another. In sum, in what matter soever there is place for addition and substraction, there also is place for reason; and where these have no place, there reason has nothing at all to do.

"Out of all which we may define what that is which is meant by the word *reason*, when we reckon it amongst the faculties of the mind. For reason, in this sense, is nothing but *reckoning* (that is, adding and substracting), of the consequences of general names agreed upon for the marking and signifying of our thoughts; — I say marking them, when we reckon by ourselves; and signifying, when we demonstrate or approve our reckonings to other men." (*Leviathan*, chap. 5.)

Agreeably to this definition, Hobbes has given to the first part of his elements of philosophy, the title of *Computatio*, sive *Logica;* evidently employing these two words as precisely synonymous.

How wonderfully does this jargon agree with the assertion of Condillac, that all equations are propositions, and all propositions equations!

These speculations, however, of Condillac and of Hobbes, relate to reasoning in general; and it is with mathematical reasoning alone that we are immediately concerned at present. That the peculiar evidence with which this is accompanied, is not resolvable into the perception of identity, has, I flatter myself, been sufficiently proved in the beginning of this article; and the plausible extension by Condillac of the very same theory to our reasonings in all the different branches of moral science, affords a strong additional presumption in favor of our conclusion.

Evidence of the mechanical philosophy not to be confounded with that which is properly called demonstrative or mathematical. — Next to geometry and arithmetic, in point of evidence and certainty, is that branch of general physics which is now called *mechanical philosophy* [or *mechanics*, simply]; a science in which the progress of discovery has been astonishingly rapid, during the course of the last century; and which, in the systematical concatenation and filiation of its elementary principles, exhibits every day more and more of that logical simplicity and elegance which we admire in the works of the Greek mathematicians. It may, I think, be fairly questioned, whether, in this department of knowledge, the affectation of mathematical method has not been already carried to an excess; the essential distinction between mechanical and mathematical truths being, in many of the physical systems which have lately appeared on the Continent, studiously kept out of the reader's view, by exhibiting both, as nearly as possible, in the same form. A variety of circumstances, indeed, conspire to identify in the imagination, and, of consequence, to assimilate in the mode of their statement, these two very different classes of propositions; but as this assimilation, besides its obvious tendency to involve experimental facts in metaphysical mystery, is apt occasionally to lead to very erroneous logical conclusions, it becomes the more necessary, in proportion as it arises from a natural bias, to point out the causes in which it has originated, and the limitations with which it ought to be understood.

The following slight remarks will sufficiently explain my general ideas on this important article of logic.

1. As the study of the mechanical philosophy is, in a great measure, inaccessible to those who have not received a regular mathematical education, it commonly happens, that a taste for it is, in the first instance, grafted on a previous attachment to the researches of pure or abstract mathematics. Hence a natural and insensible transference to physical pursuits, of mathematical habits of thinking; and hence an almost unavoidable propensity to give to the former science that systematical connection in all its various conclusions which, from the nature of its first principles, is essential to the latter, but which can never belong to any science which has its foundations laid in facts, collected from experience and observation.

2. Another circumstance which has coöperated powerfully with the former in producing the same effect, is that proneness to simplification which has misled the mind, more or less, in all its researches, and which, in natural philosophy, is peculiarly encouraged by those beautiful analogies which are observable among different physical phenomena, — analogies, at the same time, which, however pleasing to the fancy, cannot always be resolved by our reason into one general law. In a remarkable analogy, for example, which presents itself between the equality of action and reaction in the collision of bodies, and what obtains in their mutual attractions, the coincidence is so perfect, as to enable us to comprehend all the various facts in the same theorem; and it is difficult to resist the temptation which it seems to offer to our ingenuity, of attempting to trace it, in both cases, to some common principle. Such trials of theoretical skill, I would not be understood to censure indiscriminately; but in the present instance, I am fully persuaded, that it is at once more unexceptionable in point of sound logic, and more satisfactory to the learner, to establish the fact, in particular cases, by an appeal to experiment; and to state the law of action and reaction in the collision of bodies, as well as that which regulates the mutual tendencies of bodies towards each other, merely as general rules which have been obtained by induction, and which are found to hold invariably as far as our knowledge of nature extends.

3. To these remarks it may be added, that even when one proposition in natural philosophy is logically deducible from another, it may frequently be expedient, in communicating the elements of the science, to illustrate and confirm the consequence, as well as the principle, by experiment. This I should apprehend to be proper wherever a consequence is inferred from a principle less familiar and intelligible than itself; a thing which must occasionally happen in physics, from the complete incorporation, if I may use the expression, which, in modern times, has taken place between physical truths, and the discoveries of mathematicians. The necessary effect of this incorporation was, to give to natural philosophy a mathematical form, and to sys-

tematize its conclusions, as far as possible, agreeably to rules suggested by mathematical method.

Arbitrary selection of the premises in mathematical reasoning. — In pure mathematics, where the truths which we investigate are all coexistent in point of time, it is universally allowed, that one proposition is said to be a consequence of another, only with a reference to our established arrangements. Thus, all the properties of the circle might be as rigorously deduced from any one general property of the curve, as from the equality of the radii. But it does not therefore follow, that all these arrangements would be equally convenient; on the contrary, it is evidently useful, and indeed necessary, to lead the mind, as far as the thing is practicable, from what is simple to what is more complex. The misfortune is, that it seems impossible to carry this rule universally into execution; and accordingly, in the most elegant geometrical treatises which have yet appeared, instances occur, in which consequences are deduced from principles more complicated than themselves.

Such inversions, however, of what may justly be regarded as the natural order, must always be felt by the author as a subject of regret; and, in proportion to their frequency, they detract both from the beauty and from the didactic simplicity of his general design.

Abstract conclusions in mechanics should be verified by experiment. — The same thing often happens in the elementary doctrines of natural philosophy. A very obvious example occurs, in the different demonstrations given by writers on mechanics, from the resolution of forces, of the fundamental proposition concerning the lever; demonstrations in which the proposition, even in the simple case when the directions of the forces are supposed to be parallel, is inferred from a process of reasoning involving one of the most refined principles employed in the mechanical philosophy. I do not object to this arrangement as illogical; nor do I presume to say that it is injudicious. I would only suggest the propriety, in such instances, of confirming and illustrating the conclusion by an appeal to experiment; an appeal which, in natural philosophy, possesses an authority equal to that which is generally, but very improperly, considered as a mathematical demonstration of physical truths. In pure geometry, no reference to the senses can be admitted, but in the way of illustration; and any such reference, in the most trifling step of a demonstration, vitiates the whole. But in natural philosophy, all our reasonings must be grounded on principles for which no evidence but that of sense can be obtained; and the propositions which we establish, differ from each other only as they are deduced from such principles immediately, or by the intervention of a mathematical demonstration. An experimental proof, therefore, of any particular physical truth, when it can be conveniently obtained, although it may not always be the most elegant or the most expedient way of introducing it to the knowledge of the student, is as rigorous and as satisfactory as any other; for the intervention of a process of mathematical reasoning can never bestow on our conclusions a greater degree of certainty than our principles possessed.

Excessive use of mathematical reasoning in physics. — I have been led to enlarge on these topics by that unqualified application of mathematical method to physics, which has been fashionable for many years past among foreign writers, and which seems to have originated chiefly in the commanding influence which the genius and learning of Leibnitz has so long maintained over the scientific taste of most European nations. In an account, lately published, of the Life and Writings of Dr. Reid, I have taken notice of some other inconveniences resulting from it, still more important than the introduction of an unsound logic into the elements of natural philosophy; in particular, of the obvious tendency which it has to withdraw the attention from that unity of design which is the noblest employment of philosophy to illustrate, by disguising it under the semblance of an eternal and necessary order, similar to what the mathematician delights to trace among the mutual relations of quantities and figures. The consequence has been, (in too many physical systems,) to level the study of nature, in point of moral interest, with the investigations of the algebraist; — an effect, too, which has taken place most remarkably, where, from the sublimity of the subject, it was least to be expected, — in the application of the mechanical philosophy to the phenomena of the heavens. But on this very extensive and important topic I must not enter at present.

The opposite error, of ranking mathematics among the sciences of experiment and observation, confuted. — In the opposite extreme to the error which I have now been endeavoring to correct, is a paradox, which was broached about twenty years ago by the late ingenious Dr. Beddoes; and which has since been adopted by some writers whose names are better entitled, on a question of this sort, to give weight to their opinions. By the partizans of this new doctrine, it seems to be imagined that, so far from physics being a branch of mathematics, mathematics, and more particularly geometry, is, in reality, only a branch of physics. "The mathematical sciences," says Dr. Beddoes, "are sciences of experiment and observation, founded solely on the induction of particular facts; as much so as mechanics, astronomy, optics, or chemistry. In the kind of evidence, there is no difference; for it originates from perception in all these cases alike; but mathematical experiments are more simple, and more perfectly within the grasp of our senses, and our perceptions of mathematical objects are clearer."

A doctrine essentially the same, though expressed in terms not quite so revolting, has been lately sanctioned by Mr. Leslie; and it is to his view of the argument that I mean to confine my attention at present. "The whole structure of geometry," he remarks, "is grounded on the simple comparison of triangles; and all the fundamental theorems which relate to this comparison, derive their evidence from the mere superposition of the triangles themselves; a mode of proof which, in reality, is nothing but an ultimate appeal, though of the easiest and most familiar kind, to external observation."* And, in another passage: "Geometry, like the other sciences which are not concerned about the operations of mind, rests ultimately on external observations. But those ultimate facts are so few, so distinct and obvious, that the subsequent train of reasoning is safely pursued to an unlimited extent, without ever appealing again to the evidence of the senses."

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* Elements of Geometry and of Geometrical Analysis, etc. By Mr. Leslie. Edinburgh, 1809. The assertion that the whole structure of geometry is founded on the comparison of triangles, is expressed in terms too unqualified. D'Alembert has mentioned another principle as not less

The two arguments adduced to support this doctrine. — Before proceeding to make any remarks on this theory, it is proper to premise, that it involves two separate considerations, which it is of material consequence to distinguish from each other. The first is, that *extension and figure*, the subjects of geometry, *are qualities of body which are made known to us by our external senses alone*, and which actually fall under the consideration of the natural philosopher, as well as of the mathematician. The second, that the whole fabric of *geometrical science rests on the comparison of triangles, in forming which comparison, we are ultimately obliged to appeal* (in the same manner as in establishing the first principles of physics) *to a sensible and experimental proof.*

1. *The mathematical affections of matter are necessary and eternal, and therefore not dependent on the evidence of the senses.* — In answer to the first of these allegations, it might perhaps be sufficient to observe, that in order to identify two sciences, it is not enough to state, that they are both conversant about the same objects; it is necessary further to show, that in both cases, these objects are considered in the same point of view, and give

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fundamental, the measurement of angles by circular arches. "*The fundamental propositions of geometry may be reduced to two; the measure of angles by circular arcs, and the principle of superposition.*" The same writer, however, justly observes, in another part of his works, that the measure of angles by circular arches, is itself dependent on the principle of superposition: and that, consequently, however extensive and important in its application, it is entitled only to rank with what he calls principles of a second order.

Instead, therefore, of saying that the whole structure of geometry is grounded on the comparison of triangles, it would be more correct to say, that it is grounded on the principle of superposition.

employment to the same faculties of the mind. The poet, the painter, the gardener, and the botanist, are all occupied, in various degrees and modes, with the study of the vegetable kingdom; yet who has ever thought of confounding their several pursuits under one common name? The natural historian, the civil historian, the moralist, the logician, the dramatist, and the statesman, are all engaged in the study of man, and of the principles of human nature; yet how widely discriminated are these various departments of science and of art! how different are the kinds of evidence on which they respectively rest! how different the intellectual habits which they have a tendency to form! Indeed, if this mode of generalization were to be admitted as legitimate, it would lead us to blend all the objects of science into one and the same mass; inasmuch as it is by the same impressions on our external senses, that our intellectual faculties are, in the first instance, roused to action, and all the first elements of our knowledge unfolded.

In the instance, however, before us, there is a very remarkable specialty, or rather singularity, which renders the attempt to identify the objects of geometrical and physical science incomparably more illogical than it would be to classify poetry with botany, or the natural history of man with the political history of nations. This specialty arises from certain peculiarities in the metaphysical nature of those sensible qualities which fall under the consideration of the geometer; and which led me, in a different work, to distinguish them from other sensible qualities (both primary and secondary,) by bestowing on them the title of *mathematical affections of matter.* Of these mathematical affections (*magnitude* and *figure*) our first notions are, no doubt, derived (as well as of *hardness, softness, roughness,* and *smoothness*) from the exercise of our external senses; but it is equally certain, that when the notions of magnitude and figure have once been acquired, the mind is immediately led to consider them as attributes of space no less than of body: and (abstracting them entirely from the other sensible qualities perceived in conjunction with them,) becomes impressed with an irresistible conviction, that *their existence is necessary and eternal,* and that it would remain unchanged if all the bodies in the universe were annihilated. It is not our business here to inquire into the origin and grounds of this conviction. It is with the fact alone that we are concerned at present; and this I conceive to be one of the most obviously incontrovertible which the circle of our knowledge embraces. Let those explain it as they best can, who are of opinion, that all the judgments of the human understanding rest ultimately on observation and experience.

Nor is this the only case in which the mind forms conclusions concerning space, to which those of the natural philosopher do not bear the remotest analogy. *Is it from experience we learn that space is infinite? or*, to express myself in more unexceptionable terms, *that no limits can be assigned to its immensity?* Here is a fact, extending not only beyond the reach of our personal observation, but beyond the observation of all created beings; and a fact on which we pronounce with no less confidence, when in imagination we transport ourselves to the utmost verge of the material universe, than when we confine our thoughts to those regions of the globe which have been explored by travellers. How unlike those *general laws* which we investigate *in physics*, and which, how far soever we may find them to reach, may still, for any thing we are able to discover to the contrary, be *only contingent, local, and temporary.**

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* [Mr. J. S. Mill is the latest writer of authority who has maintained the doctrine of Beddoes and Leslie, that even pure mathematics is an inductive science, and depends ultimately on external observation. The following is a summary of his argument upon this point, though it deserves notice only as the attempt of a very acute reasoner to support a thesis which is wholly indefensible. Only a love of paradox, or the bias of a previously conceived theory, could induce any one to controvert the doctrine of Mr. Stewart in the text, which expresses the almost unanimous opinion of the scientific world.

But Mr. Mill avers that geometrical axioms "are experimental axioms — generalizations from observation. The proposition, 'Two straight lines cannot inclose a space' — or in other words, 'Two straight lines which have once met, do not meet again, but continue to diverge' — is an induction from the evidence of our senses."

When it is urged that actual observation is not needed to convince us

It must indeed be owned, with respect to the conclusions hitherto mentioned on the subject of space, that they are rather of a metaphysical, than of a mathematical nature; but they are not, on that account, the less applicable to our purpose; for if the theory of Beddoes had any foundation, it would lead us to identify with physics the former of these sciences as well as the latter; at least, all that part of the former which is employed about space or extension, — a favorite object of metaphysical as well as of mathematical speculation. The truth, however, is, that *some of our metaphysical conclusions concern-*

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of the truth of this axiom, but that our assent is given merely by thinking of it, or as soon as we understand the meaning of the words, he answers, "one of the characteristic properties of geometrical forms is their capacity of being painted in the imagination with a distinctness equal to reality." These mental pictures are "just as fit subjects of geometrical experimentation as the realities themselves." "The foundations of geometry would therefore be laid in direct experience, even if the experiments, (which in this case consist merely in attentive contemplation) were practised solely upon what we call *our ideas,* — that is, upon the diagrams in our minds, and not upon outward objects."

But we declare that the lines could not meet even if they were prolonged to infinity, — a fact which cannot be proved by actual observation, because we cannot follow them to infinity. Mr. Mill replies, that, without so following them, "we may know that, if they ever do meet, or indeed if, after diverging from one another, they begin again to approach, this must take place, not at an infinite, but at a finite distance. Supposing, therefore, such to be the case, we can transport ourselves thither in imagination, and can frame a mental image of the appearance which one or both of the lines must present at that point, which we may rely upon as being precisely similar to the reality. Now, whether we fix our contemplation upon this imaginary picture, or call to mind the generalizations we have had occasion to make from former ocular observation, we shall either way be equally satisfied, that a line which, after diverging from another straight line, begins to approach to it, produces the impression on our senses which we describe by the expression 'a bent line,' not by the expression, 'a straight line.'"

The first argument being thus disposed of, we proceed to the second. "Axioms (it is asserted) are conceived by us not only as true, but as universally and necessarily true. Now experience cannot possibly give to any proposition this character. I may have seen snow a hundred times, and may have seen that it was white; but this cannot give me entire *ing space are more nearly allied to geometrical theorems than we might be disposed at first to apprehend;* being involved or implied in the most simple and fundamental propositions which occur in Euclid's Elements. When it is asserted, for example, that "if one straight line falls on two other straight lines, so as to make the two interior angles on the same side together equal to two right angles, these two straight lines, though indefinitely produced, will never meet;" — is not the boundless immensity of space tacitly assumed as a thing unquestionable?

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assurance even that *all* snow is white; much less, that snow *must* be white."

The answer to this argument is really curious, as showing the writer's incapacity of perceiving the distinction, which is a fundamental one, between necessary and contingent truths. "I cannot but wonder," says Mr. Mill, "that so much stress should be laid upon the circumstance of inconceivableness, when there is such ample experience to show, that our capacity or incapacity of conceiving a thing has very little to do with the possibility of the thing in itself; but is in truth very much an affair of accident, and depends upon the past history and habits of our own minds. There is no more generally acknowledged fact in human nature, than the extreme difficulty at first felt in conceiving any thing as possible, which is in contradiction to long established and familiar experience, or even to old and familiar habits of thought." "There are remarkable instances of this in the history of science; instances in which the wisest men rejected as impossible, because inconceivable, things which their posterity, by earlier practice and longer perseverance in the attempt, found it quite easy to conceive, and which everybody now knows to be true." Mr. Mill proceeds to adduce, as such instances, the fact that there was a time when men of the most cultivated intellects could not credit the existence of antipodes; could not conceive the force of gravity acting upwards; or that a body could act upon the earth at the distance of the sun or moon.

The inference from this reasoning seems to be, that there is no proposition now regarded as a necessary truth, which may not, at some future time, come to be generally disbelieved. In the future progress of knowledge, he seems to think it may be ascertained that the three angles of a plane triangle are *not* equal to two right angles! It is certainly not impossible that the sun may not rise to-morrow; we can easily conceive that it may not; though it is a fact attested by universal experience, that, to every place in the torrid and temperate zones, the sun has risen once in every twenty-four hours. Yet who does not perceive the difference, in point of logical certainty, between the proposition that the sun will rise to-morrow, and the axiom that two straight lines cannot inclose a space?[1]

And is not a universal affirmation made with respect to a fact *which experience is equally incompetent to disprove or to confirm?* In like manner, when it is said, that "triangles on the same base, and between the same parallels are equal," do we feel ourselves the less ready to give our assent to the demonstration, if it should be supposed, that the one triangle is confined within the limits of the paper before us, and that the other, standing on the same base, has its vertex placed beyond the sphere of the fixed stars? In various instances, we are led, with a force equally imperious, to acquiesce in conclusions, which not only admit of no illustration or proof from the perceptions of sense, but which, at first sight, are apt to stagger and confound the faculty of imagination. It is sufficient to mention, as examples of this, the relation between the hyperbola and its asymptotes, [which are constantly approaching each other, and yet will not meet till they are extended to infinity]; and the still more obvious truth of the infinite divisibility of extension. What analogy is there between such propositions as these, and that which announces, that the mercury in the Torricellian tube will fall, if carried up to the top of a mountain; or that the vibrations of a pendulum of a given length will be performed in the same time, while it remains in the same latitude? Were there, in reality, that analogy between mathematical and physical propositions, which Beddoes and his followers have fancied, the equality of the square of the hypothenuse of a right angled triangle to the squares described on the two other sides, and the proportion of 1, 2, 3, between the cone and its circumscribed hemisphere and cylinder, might, with fully as great propriety, be considered in the light of physical phenomena, as of geometrical theorems. Nor would it have been at all inconsistent with the logical unity of his work, if Mr. Leslie had annexed to his Elements of Geometry, a scholium concerning the final causes of circles and of straight lines, similar to that which, with such sublime effect, closes the Principia of Sir Isaac Newton.*

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* In the course of my own experience, I have met with one person, of no common ingenuity, who seemed seriously disposed to consider the truths of geometry very nearly in this light. The person I allude to was

2. *The geometer's superposition of triangles is ideal, and not actual.* — It yet remains for me to say a few words upon that superposition of triangles, which is the groundwork of all our geometrical reasonings concerning the relations which different species bear to one another in respect of magnitude. And here I must take the liberty to remark, in the first place, that the fact in question has been stated in terms much too loose and incorrect for a logical argument. When it is said, that "all the

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James Ferguson, author of the justly popular works on Astronomy and Mechanics. In the year 1768, he paid a visit to Edinburgh, when I had not only an opportunity of attending his public course of lectures, but of frequently enjoying, in private, the pleasure of his very interesting conversation. I remember distinctly to have heard him say, that he had more than once attempted to study the Elements of Euclid; but found himself quite unable to enter into that species of reasoning. The second proposition of the first book he mentioned particularly, as one of his stumbling-blocks at the very outset; — the circuitous process by which Euclid sets about an operation which never could puzzle, for a single moment, any man who had seen a pair of compasses, appearing to him altogether capricious and ludicrous. He added, at the same time, that as there were various geometrical theorems of which he had daily occasion to make use, he had satisfied himself of their truth, either by means of his compasses and scale, or by some mechanical contrivances of his own invention. Of one of these I have still a perfect recollection; — his mechanical or experimental demonstration of the 47th proposition of Euclid's first book, by cutting a card so as to afford an ocular proof, that the squares of the two sides actually filled the same space with the square of the hypothenuse.

To those who reflect on the disadvantages under which Mr. Ferguson had labored in point of education, and on the early and exclusive hold which experimental science had taken of his mind, it will not perhaps seem altogether unaccountable, that the refined and scrupulous logic of Euclid should have struck him as tedious, and even unsatisfactory, in comparison of that more summary and palpable evidence on which his judgment was accustomed to rest.

"Mr. Ferguson's general mathematical knowledge," says Dr. Hutton, "was little or nothing. Of algebra, he understood little more than the notation; and he has often told me he could never demonstrate one proposition in Euclid's Elements; his constant method being to satisfy himself, as to the truth of any problem, with a measurement by scale and compasses." — Hutton's *Mathematical and Philosophical Dictionary*, article *Ferguson.*

fundamental theorems which relate to the comparison of triangles, derive their evidence from the mere superposition of the triangles themselves," it seems difficult, or rather impossible, to annex to the adjective *mere*, an idea at all different from what would be conveyed, if the word *actual* were to be substituted in its place; more especially, when we attend to the assertion which immediately follows, that "this mode of proof is, in reality, nothing but an ultimate appeal, though of the easiest and most familiar kind, to external observation." But if this be, in truth, the sense in which we are to interpret the statement quoted above, (and I cannot conceive any other interpretation of which it admits,) it must appear obvious, upon the slightest reflection, that the statement proceeds upon a total misapprehension of the principle of superposition; inasmuch as it is not to an *actual or mere superposition*, but to *an imaginary or ideal one*, that any appeal is ever made by the geometer. Between these two modes of proof the difference is not only wide, but radical and essential. The one would, indeed, level geometry with physics, in point of evidence, by building the whole of its reasoning on a fact ascertained by mechanical measurement; the other is addressed to the understanding, and to the understanding alone, and is as rigorously conclusive as it is possible for demonstration to be.*

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* The same remark was, more than fifty years ago, made by D'Alembert, in reply to some mathematicians on the Continent, who, it would appear, had then adopted a paradox very nearly approaching to that which I am now combating. "Le principe de la superposition n'est point, comme l'ont prétendu plusieurs géometres, une méthode de démontrer peu exacte et purement mécanique. La superposition, telle que les mathématiciens la conçoivent, ne consiste pas à appliquer grossièrement une figure sur une autre, pour juger par les yeux de leur égalité ou de leur difference, comme un ouvrier applique son pié sur une ligne pour la mesurer; elle consiste à imaginer une figure transportée sur une autre, et à conclure de l' égalité supposée de certaines parties de deux figures, la coincidence de ces parties entr'elles, et de leur coincidence la coincidence du reste: d'où résulte l'égalité et la similitude parfaites des figures entières."

["The principle of superposition is not, as many geometers have sup-

That the reasoning employed by Euclid in proof of the fourth proposition of his first book is completely demonstrative, will be readily granted by those who compare its different steps with the conclusions to which we were formerly led, when treating of the nature of mathematical demonstration. In none of these steps is any appeal made to facts resting on the evidence of sense, nor, indeed, to any facts whatever. The constant appeal is to the definition of equality.* "Let the triangle A B C," says Euclid, "be applied to the triangle D E F; the point A to the point D, and the straight line A B to the straight line D E; the point B will coincide with the point E, because A B is equal to D E. And A B coinciding with D E, A C will coincide with D F, because the angle B A C is equal to the angle E D F." A similar remark will be found to apply to every remaining step of the reasoning; and, therefore, this reasoning possesses the peculiar characteristic which distinguishes mathematical evidence from that of all the other sci-

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posed, an inexact and purely mechanical mode of demonstration. Superposition in mathematics does not consist in applying one figure to the other, in order to judge by the eye whether they differ or coincide, just as a workman applies his foot-rule to a line in order to measure it; it consists in imagining one figure placed over the other, and concluding, from the supposed equality of certain parts of the two figures, the coincidence of these parts with each other, and from their coincidence inferring the coincidence of the other parts; whence results the perfect equality and similitude of the whole figures."]

About a century before the time when D'Alembert wrote these observations, a similar view of the subject was taken by Dr. Barrow; a writer who, like D'Alembert, added to the skill and originality of an inventive mathematician, the most refined, and, at the same time, the justest ideas concerning the theory of those intellectual processes which are subservient to mathematical reasoning.

* It was before observed, that Euclid's eighth axiom (magnitudes which coincide with each other are equal) ought, in point of logical rigor, to have been stated in the form of a definition. In our present argument, however, It is not of material consequence whether this criticism be adopted or not. Whether we consider the proposition in question in the light of an axiom or of a definition, it is equally evident, that it does not express a fact ascertained by observation or by experiment.

ences, — that it rests wholly on hypotheses and definitions, and in no respect upon any statement of facts, true or false. The ideas, indeed, of extension, of a triangle, and of equality, presuppose the exercise of our senses. Nay, the very idea of superposition involves that of motion, and consequently (as the parts of space are immovable) of a material triangle. But where is there any thing analogous, in all this, to those sensible facts, which are the principles of our reasoning in physics; and which, according as they have been accurately or inaccurately ascertained, determine the accuracy or inaccuracy of our conclusions? The material triangle itself, as conceived by the mathematician, is *the object, not of sense, but of intellect.* It is not an actual measure, liable to expansion or contraction, from the influence of heat or of cold; *nor does it require, in the ideal use which is made of it* by the student, *the slightest address of hand or nicety of eye.* Even in explaining this demonstration for the first time to a pupil, how slender soever his capacity might be, I do not believe that any teacher ever thought of illustrating its meaning by the actual application of the one triangle to the other. No teacher, at least, would do so, who had formed correct notions of the nature of mathematical science.

If the justness of these remarks be admitted, the demonstration in question must be allowed to be as well entitled to the name, as any other which the mathematician can produce; for as our conclusions relative to the properties of the circle, considered in the light of hypothetical theorems, are not the less rigorously and necessarily true, that no material circle may anywhere exists corresponding exactly to the definition of that figure, so the proof given by Euclid of the fourth proposition would not be the less demonstrative, *although our senses were incomparably less acute than they are,* and although no material triangle continued of the same magnitude for a single instant. Indeed, when we have once acquired the ideas of equality and of a common measure, our mathematical conclusions would not be in the least affected, if all the bodies in the universe should vanish into nothing.

IV. OF OUR REASONINGS CONCERNING PROBABLE OR

CONTINGENT TRUTHS. 1. *Narrow field of demonstrative evidence.* — If the account which has been given of the nature of demonstrative evidence be admitted, the province over which it extends must be limited almost entirely to the objects of pure mathematics. A science perfectly analogous to this, in point of evidence, may, indeed, be conceived, as I have already remarked, to consist of a series of propositions relating to moral, to political, or to physical subjects; but as it could answer no other purpose than to display the ingenuity of the inventor, hardly any thing of the kind has been hitherto attempted. The only exception which I can think of, occurs in the speculations formerly mentioned under the title of *theoretical mechanics.*

On the application of mathematics in practical geometry and physics. — But if the field of mathematical demonstration be limited entirely to hypothetical or conditional truths, whence, it may be asked, arises the extensive and the various utility of mathematical knowledge in our physical researches, and in the arts of life? The answer, I apprehend, is to be found in certain peculiarities of those objects to which the suppositions of the mathematician are confined; in consequence of which peculiarities, *real combinations of circumstances* may fall under the examination of our senses, *approximating far more nearly to what his definitions describe*, than is to be expected in any other theoretical process of the human mind. Hence a corresponding *coincidence between his abstract conclusions, and those facts in practical geometry and in physics* which they help him to ascertain.

For the more complete illustration of this subject, it may be observed in the first place, that although the peculiar force of that reasoning which is properly called mathematical, depends on the circumstance of its principles being hypothetical, yet if, in any instance, the supposition could be ascertained as actually existing, the conclusion might, with the very same certainty, be applied. If I were satisfied, for example, that in a particular circle drawn on paper, all the radii were exactly equal, every property which Euclid has demonstrated of that curve, might be confidently affirmed to belong to this diagram. As the thing, however, here supposed, is rendered impossible by the imperfection of our senses, the truths of geometry can never, *in their practical applications*, possess demonstrative evidence; but only that kind of evidence which our organs of perception enable us to obtain.

But although, in the practical applications of mathematics, the evidence of our conclusions differs essentially from that which belongs to the truths investigated in the theory, it does not therefore follow that these conclusions are the less important. *In proportion to the accuracy of our data will be that of all our subsequent deductions;* and it fortunately happens, that the same imperfections of sense which limit what is physically attainable in the former, limit also, to the very same extent, what is practically useful in the latter. The astonishing precision which the mechanical ingenuity of modern times has given to mathematical instruments, has, in fact, communicated a nicety to the results of practical geometry, beyond the ordinary demands of human life, and far beyond the most sanguine anticipations of our forefathers.*

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* See a very interesting and able article, in the fifth volume of the Edinburgh Review, on Colonel Mudge's account of the operations carried on for accomplishing a trigonometrical survey of England and Wales. I cannot deny myself the pleasure of quoting a few sentences.

"In two distances that were deduced from sets of triangles, the one measured by General Roy in 1787, the other by Major Mudge in 1794, one of 24,133 miles, and the other of 38,688, the two measures agreed within a foot as to the first distance, and sixteen inches as to the second. Such an agreement, where the observers and the instruments were both different, where the lines measured were of such extent, and deduced from such a variety of data, is probably without any other example. Coincidences of this sort are frequent in the trigonometrical survey, and prove how much more good instruments, used by skilful and attentive observers, are capable of performing, than the most sanguine theorist could have ever ventured to foretell.

"It is curious to compare the early essays of practical geometry with the perfections to which its operations have now reached, and to consider that, while the artist had made so little progress, the theorist had reached

This remarkable, and indeed singular coincidence of propositions purely hypothetical, with facts which fall under the examination of our senses, is owing, as I already hinted, to the peculiar nature of the objects about which mathematics is conversant; and to the opportunity which we have (in consequence of that mensurability,* which belongs to all of them) of adjusting, with a degree of accuracy approximating nearly to the truth, the data from which we are to reason in our practical operations, to those which are assumed in our theory. The only affections of matter which these objects comprehend are *extension* and *figure ;* affections which matter possesses in common with space, and which may therefore be separated in fact, as well as abstracted in thought, from all its other sensible qualities. In examining, accordingly, the relations of quantity con-

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many of the sublimest heights of mathematical speculation; that the latter had found out the area of the circle, and calculated its circumference to more than a hundred places of decimals, when the former could hardly divide an arc into minutes of a degree; and that many excellent treatises had been written on the properties of curve lines, before a straight line of considerable length had ever been carefully drawn, or exactly measured on the surface of the earth."

* In an Essay on Quantity, by Dr. Reid, published in the transactions of the Royal Society of London, for the year 1748, mathematics is very correctly defined to be "*the doctrine of measure.*" "The object of this science," the author observes, "is commonly said to be quantity; in which case, quantity ought to be defined, what may be measured. Those who have defined quantity to be whatever is capable of more or less, have given too wide a notion of it, which has led some persons to apply mathematical reasoning to subjects that do not admit of it." The appropriate objects of this science are therefore such things alone as admit, not only of being increased and diminished, but of being multiplied and divided. In other words, the common quality which characterizes all of them is their *mensurability.*

In the same essay, Dr. Reid has illustrated, with much ingenuity, a distinction (hinted at by Aristotle) of quantity into proper and improper. "I call that," says he, "*proper quantity,* which is *measured by its own kind;* or which, of its own nature, is capable of being doubled or trebled, without taking in any quantity of a different kind as a measure of it. Thus a line is measured by known lines, as inches, feet, or miles; and the length of a foot being known, there can be no question about the length of two nected with these affections, we are not liable to be disturbed by those physical accidents, which, in the other applications of mathematical science, necessarily render the result more or less at variance with the theory. In measuring the height of a mountain, or in the survey of a country, if we are at due pains in ascertaining our data, and if we reason from them with mathematical strictness, the result may be depended on as accurate within very narrow limits; and as there is nothing but the incorrectness of our data by which the result can be vitiated, the limits of possible error may themselves be assigned. But in the simplest applications of mathematics to *mechanics* or to *physics*, the abstractions which are necessary in the theory, must always leave out circumstances which are essentially connected with the effect. In demonstrating, for example, the property of the lever, we abstract entirely from its own weight, and consider it as an inflexible mathematical line; — suppositions with which the fact cannot possibly correspond; and for which, of course, allowances (which nothing but physical experience can enable us to judge of) must be made in practice.

Next to practical geometry, properly so called, one of the

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feet, or of any part or multiple of a foot. This known length, by being multiplied or divided, is sufficient to give us a distinct idea of any length whatsoever.

"*Improper quantity* is that which *cannot be measured by its own kind*, but to which we assign a measure in some proper quantity that is related to it. Thus velocity of *motion*, when we consider it by itself, cannot be measured. We may perceive one body to move faster, another slower, but we can perceive no proportion or ratio between their velocities, without taking in some quantity of another kind to measure them by. Having therefore observed, that by a greater velocity, a greater space is passed over in the same time, by a less velocity a less space, and by an equal velocity an equal space; we hence learn to *measure velocity by the space* passed over in a given time, and to reckon it to be in exact proportion to that; and having once assigned this measure to it, we can then, and not till then, conceive one velocity exactly double, or triple, or in any proportion to another. We can then introduce it into mathematical reasoning, without danger of error or confusion; and may use it as a measure of other improper quantities."

easiest applications of mathematical theory occurs in those branches of *optics* which are distinguished by the name of *catoptrics* and *dioptrics*. In these, the physical principles from which we reason are few and precisely definite, and the rest of the process is as purely geometrical as the Elements of Euclid.

In that part of *astronomy*, too, which relates solely to the phenomena, without any consideration of physical causes, our reasonings are purely geometrical. The data, indeed, on which we proceed, must have been previously ascertained by observation; but the inferences we draw from these are connected with them by mathematical demonstration, and are accessible to all who are acquainted with the theory of spherics.

In physical astronomy, the law of gravitation becomes also a principle or datum in our reasonings; but, as in the celestial phenomena it is disengaged from the effects of the various other causes which are combined with it near the surface of our planet, this branch of physics, as it is of all the most sublime and comprehensive in its objects, so it seems, in a greater degree than any other, to open a fair and advantageous field for mathematical ingenuity.

On the fundamental law of belief involved in all our reasonings about contingent truths.—In the instances which have been last mentioned, the evidence of our conclusions resolves ultimately not only into that of sense, but into another law of belief formerly mentioned; that which leads us to expect the continuance, in future, of the established order of physical phenomena. A very striking illustration of this presents itself in the computations of the astronomer; on the faith of which he predicts, with the most perfect assurance, many centuries before they happen, the appearances which the heavenly bodies are to exhibit. The same fact is assumed in all our conclusions in natural philosophy; and something extremely analogous to it in all our conclusions concerning human affairs. They relate, in both cases, not to necessary connections, but to probable or contingent events; of which, how confidently soever we may expect them to take place, the failure is by no means perceived to be impossible. Such conclusions, therefore, differ essentially from those to which we are led by the demonstrations of pure mathematics, which not only command our assent to the theorems they establish, but satisfy us that the contrary suppositions are absurd.

These examples may suffice to convey a general idea of the distinction between demonstrative and probable evidence; and I purposely borrowed them from sciences where the two are brought into immediate contrast with each other, and where the authority of both has hitherto been equally undisputed.

Before prosecuting any further the subject of probable evidence, some attention seems to be due, in the first place, to the grounds of that fundamental supposition on which it proceeds, — the stability of the order of nature. Of this important subject, accordingly, I propose to treat at some length.

2. *Of the permanence or stability in the order of nature, which is presupposed in our reasonings concerning contingent truths.* — In the language of modern science, the established order in the succession of physical events, is commonly referred (by a sort of figure or metaphor) to the general *laws of nature.** It is a mode of speaking extremely convenient from its conciseness, but is apt to suggest to the fancy a groundless, and, indeed, absurd analogy between the *material* and the *moral worlds.* As the order of society results from the laws prescribed by the legislator, so the order of the universe is conceived to result from certain laws established by the Deity. Thus, it is customary to say, that the fall of heavy bodies towards the earth's surface, the ebbing and flowing of the sea, and the motions of the planets in their orbits, are consequences of the *law* of gravitation. But although, in one sense, this may be abundantly accurate, it ought always to be kept in view, that it is not a literal, but *a metaphorical, statement* of the truth; a statement somewhat analogous to that poetical expression in the sacred writings, in which God is said "to have given his decree to the seas, that they should not pass his com-

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* [See note to page 6.]

mandment." In those political associations from which the metaphor is borrowed, *the laws are addressed to rational and voluntary agents*, who are able to comprehend their meaning, and to regulate their conduct accordingly; whereas, in the *material universe*, the subjects of our observation are understood by all men to be *unconscious and passive*, (that is, are understood to be unchangeable in their state, without the influence of some foreign and external force;) and consequently, the order so admirably maintained, amidst all the various changes which they actually undergo, not only implies intelligence in its first conception, but implies, in its continued existence, *the incessant agency of power*, executing the purposes of wise design. If the word *law*, therefore, be, in such instances, literally interpreted, it must mean a uniform mode of operation prescribed by the Deity to himself; and it has accordingly been explained in this sense by some of our best philosophical writers, particularly by Dr. Clarke. In employing, however, the word with an exclusive reference to experimental philosophy, it is more correctly logical to consider it as merely a statement of some *general fact* with respect to the order of nature; a fact which has been found to hold uniformly in our past experience, and on the continuance of which, in future, the constitution of our mind determines us confidently to rely.

The laws of nature are not efficient causes. — After what has been already said, it is hardly necessary to take notice of the absurdity of that opinion, or rather of that mode of speaking, which seems to refer the order of the universe to *general laws operating as efficient causes.** Absurd, however, as it is, there is reason to suspect, that it has, with many, had the effect of keeping the Deity out of view, while they were studying his works. To an incautious use of the same very equivocal phrase, may be traced the bewildering obscurity in the speculations of some eminent French writers, concerning its metaphysical import. Even the great Montesquieu, in the very first chapter of his principal work, has lost himself in a fruitless attempt to explain its meaning, when, by a simple statement of

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* [Those who have not reflected much upon the subject, are apt to imagine that a phenomenon is *accounted for*, or in other words, that *its cause is discovered*, when we have succeeded in referring it to some Law of Nature that was previously known, and with the operation of which we have become familiar. Thus, as Franklin discovered that the lightning is an electrical phenomenon, — that is, that it manifests the same appearances, and is followed by the same results, that attend the electricity which is developed by rubbing a glass tube, — he is popularly said to have discovered *the cause* of the lightning. But it should be remembered that the

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cause of electricity still remains to be ascertained. All that Franklin accomplished was to refer certain phenomena, which had hitherto been isolated, or had formed a class by themselves, to a class of other phenomena, which seem to be better known only because they are more familiar to us, and can be reproduced at pleasure.

"What is called explaining one law of nature by another," says Mr. Mill, "is but substituting one mystery for another; and does nothing to render the general course of nature other than mysterious; we can no more assign a *why* for the more extensive laws than for the partial ones. The explanation may substitute a mystery which has become familiar, and has grown to *seem* not mysterious, for one which is still strange. And this is the meaning of *explanation,* in common parlance. But the process with which we are here concerned, often does the very contrary; it resolves a phenomenon with which we are familiar, into one of which we previously knew little or nothing; as where the common fact of the fall of heavy bodies is resolved into a tendency of all particles of matter towards one another. It must be kept constantly in view, therefore, that when philosophers speak of explaining any of the phenomena of nature, they always mean, pointing out, not some more familiar, but merely some more general, phenomenon of which it is a partial exemplification."

"The laws thus explained or resolved, are sometimes said to be *accounted for;* but the expression is incorrect, if taken to mean any thing more than what has been already stated. In minds not habituated to accurate thinking, there is often a confused notion that the general laws are the *causes* of the partial ones; that the law of general gravitation, for example, *causes* the phenomena of the fall of bodies to the earth. But to assert this, would be a misuse of the word *cause;* terrestrial gravity is not an *effect* of general gravitation, but a *case* of it; that is, one kind of the particular instances in which that general law obtains. To account for a law of nature means, and can mean, no more than to assign other laws more general, together with collocations, which laws and collocations being supposed, the partial law follows without any additional supposition." — Mill's *Logic,* pp. 276, 277.]

the essential distinction between its *literal* and its *metaphorical* acceptations, he might have at once cleared up the mystery. After telling us that "laws, in their most extensive signification, are the necessary relations (*les rapports nécessaires*) which arise from the nature of things, and that, in this sense, all beings have their laws; — that the Deity has his laws; the material world its laws; intelligences superior to man their laws; the brutes their laws; man his laws;" he proceeds to remark, "That the moral world is far from being so well governed as the material; for the former, although it has its laws, which are invariable, does not observe these laws so constantly as the latter." It is evident that this remark derives whatever plausibility it possesses from *a play upon words;* from confounding moral laws with physical; or, in plainer terms, from confounding laws which are addressed by a legislator to intelligent beings, with those general conclusions concerning the established order of the universe, to which, when legitimately inferred from an induction sufficiently extensive, philosophers have metaphorically applied the title of *Laws of Nature.* In the one case, the conformity of the law with the nature of things *does not at all depend on its being observed or not,* but on the reasonableness and moral obligation of the law. In the other case, the very definition of the word *law* supposes that *it applies universally;* insomuch that, *if it failed in one single instance, it would cease to be a law.* It is, therefore, a mere quibble to say, that the laws of the material world are better observed than those of the moral; the meaning of the word *law,* in the two cases to which it is here applied, being so totally different, as to render the comparison or contrast, in the statement of which it is involved, altogether illusory and sophistical. Indeed, nothing more is necessary to strip the proposition of every semblance of plausibility, but an attention to this verbal ambiguity.

This metaphorical employment of the word *law,* to express a general fact, although it does not appear to have been adopted in the technical phraseology of ancient philosophy, is not unusual among the classical writers, when speaking of those physical arrangements, whether on the earth or in the heavens, which continue to exhibit the same appearance from age to age.

"Hic segetes, illic veniunt felicius uvæ :
Arborei fetus alibi, atque injussa virescunt
Gramina. Nonne vides, croceos ut Tmolos odores,
India mittit ebur, molles sua thura Sabæi ?
At Chalybes nudi ferrum, virosaque Pontus
Castorea, Eliadum palmas Epiros equarum ?
Continuo *has leges, æternaque fœdera* certis
Imposuit natura locis."
Virg. Georg. i. 60.*

The same metaphor occurs in another passage of the Georgics, where the poet describes the regularity which is exhibited in the economy of the bees: —

"Solæ communes natos, consortia tecta
Urbis habent, *magnisque* agitant *sub legibus* ævum."
Georg. iv. 153.†

The following lines from Ovid's account of the Pythagorean philosophy, are still more in point: —

"Et rerum causas, et quid natura docebat;
Quid Deus : Unde nives : quæ fulminis esset origo :
Jupiter, an venti, discussa nube tonarent :
Quid quateret terras, *quâ* sidera *lege* mearent,
Et quodcunque latet."
Ovid. Met. xv. 68.‡

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* ["Here golden corn, there luscious grapes abound,
There grass spontaneous, or rich fruits are found;
See'st thou not Tmolus saffron sweets dispense,
Her ivory Ind, Arabia frankincense,
The naked Chalybes their iron ore ?
To Castor Pontus gives its fetid power;
While, for Olympic games, Epirus breeds,
To whirl the circling car, the swiftest steeds.
Nature these laws and these eternal bands
First fixed on certain climes and certain lands."
Warton's translation.]

† ["They, they alone a general interest share,
Their young committing to the public care,
And all concurring in the common cause,
Live in fixed cities *under common laws*."
Warton.]

‡ ["While he discoursed of heaven's mysterious laws,
The worlds original and nature's cause;

Sagacity and foresight dependent on the uniformity of the laws of nature. — I have quoted these different passages from ancient authors, chiefly as an illustration of the strength and of the similarity of the impression which the order of nature has made on the minds of reflecting men, in all ages of the

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And what was God, and why the fleecy snows
In silence fell, and rattling winds arose
That shook the steadfast earth, and whence began,
The dance of planets round the radiant sun;
If thunder was the angry voice of Jove,
Or clouds with nitre fragrant burst above; —
Of these, and things beyond the common reach,
He spoke, and charmed his audience with his speech."
Dryden's translation.]

I shall only add to these quotations the epigram of Claudian on the instrument said to be invented by Archimedes for representing the movements of the heavenly bodies, in which various expressions occur coinciding remarkably with the scope of the foregoing observations.

"Jupiter in parvo cum cerneret æthera vitro
Risit, et ad superos talia dicat dedit.
Huccine mortalis progressa potentia curæ;
Jam meus in fragili luditur orde labor.
Jura Poli, rerumque fidem, legesque Deorum
Ecce Syracusius transtulit arte senex.
Inclusus variis famulatur spiritus astris,
Et vivum certis motibus urget opus.
Percurrit proprium mentitus signifer annum,
Et simulata novo Cynthia mense redit.
Jamque suum volvens audax industria mundum
Gaudet, et humana sidera mente regit.
Quid falso insontem tonitru Salmomea miror?
Æmula naturæ parva reperta manus."

[When Jove beheld a crystal globe display
The world, he thus addressed Olympus' train. —
Can mortals o'er the sphere possess such sway,
And such a toy my power deride as vain?
Great Heaven's decrees, th' unerring course of things,
Laws of the gods, expounds Sicilia's sage;
The flight of stars imprisoned air here wings,
Its simple powers their varying movements guage;
The Zodiac here revolves its little year,
The mimic moons succeeding months restore;
The spheres by human art attuned are here,
Impelled by it the stars in ether soar.
Instructed hence, no longer view with wonder
Salmoneus' chariot and his bridge of thunder.
Wright's translation.]

world. Nor is this wonderful; for, were things differently constituted, it would be impossible for man to derive benefit from experience; and the powers of observation and memory would be subservient only to the gratification of an idle curiosity.* In consequence of those uniform laws by which the succession of events is actually regulated, every fact collected with respect to the past is a foundation of sagacity and of skill with respect to the future; and, in truth, it is chiefly this application of experience to anticipate what is yet to happen, which forms the intellectual superiority of one individual over another. The remark holds equally in all the various pursuits of mankind, whether speculative or active. As an astronomer is able, by reasonings founded on past observations, to predict those phenomena of the heavens which astonish or terrify the savage; — as the chemist, from his previous familiarity with the changes operated upon bodies by heat or by mixture, can predict the result of innumerable experiments, which to others furnish only matter of amusement and wonder; — so a studious observer of human affairs acquires a prophetic foresight (still more incomprehensible to the multitude) with respect to the future fortunes of mankind; — a foresight which, if it does not reach, like our anticipations in physical science, to particular and definite events, amply compensates for what it wants in precision, by the extent and variety of the prospects which it opens. It is *from this apprehended analogy between the future and the past, that historical knowledge derives the whole of its value;* and were the analogy completely to fail, the records of former ages would, in point of utility, rank with the fictions of poetry. Nor is the case different in the business of common life. Upon what does the success of men in their private concerns so essentially depend as on their own *prudence;* and what else does this word mean, than a wise regard, in every step of their conduct, to the lessons which experience has taught them?

Illustrations of the uniformity of natural laws. — The departments of the universe in which we have an opportunity of seeing this regular order displayed, are the three following: — 1. The phenomena of *inanimate matter;* 2. The phenomena of *the lower animals;* and, 3. The phenomena exhibited by *the human race.*

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* [See note to page 214.]

1. On the first of these heads, I have only to repeat what was before remarked, That *in all the phenomena of the material world, the uniformity in the order of events is conceived by us to be complete and infallible;* insomuch that, to be assured of the same result upon a repetition of the same experiment, we require only to be satisfied, that both have been made in circumstances precisely similar. *A single experiment,* accordingly, if conducted with due attention, is considered, by the most cautious inquirers, as sufficient to establish *a general physical fact;* and if, on any occasion, it should be repeated a second time, for the sake of greater certainty in the conclusion, it is merely with a view of guarding against the effects of the accidental concomitants which may have escaped notice, when the first result was obtained.

2. The case is nearly similar in the phenomena exhibited by the brutes, the various tribes of which furnish a subject of examination so steady, that *the remarks made on a few individuals may be extended,* with little risk of error, *to the whole species.* To this uniformity in their instincts it is owing, that man can so easily maintain his empire over them, and employ them as agents or instruments for accomplishing his purposes; advantages which would be wholly lost to him, if the operations of instinct were as much diversified as those of human reason. Here, therefore, we may plainly trace a purpose or design, perfectly analogous to that already remarked, with respect to the laws which regulate the material world; and the difference in point of exact uniformity, which distinguishes the two classes of events, obviously arises from a certain latitude of action, which enables the brutes to accommodate themselves, in some measure, to their accidental situations; — rendering them, in consequence of this power of accommodation, incomparably *more serviceable to our race* than they would have been, if alto-

gether subjected, like mere matter, to the influence of regular and assignable causes. It is, moreover, extremely worthy of observation, concerning these two departments of the universe, that *the uniformity in the phenomena of the latter* [the brutes] *presupposes a corresponding regularity in the phenomena of the former* [inanimate matter]; insomuch that, if the established order of the material world were to be essentially disturbed (the instincts of the brutes remaining the same) all their various tribes would inevitably perish. The uniformity of animal instinct, therefore, bears a reference to the constancy and immutability of physical laws, not less manifest, than that of the fin of the fish to the properties of the water, or of the wing of the bird to those of the atmosphere.

3. When from the phenomena of inanimate matter and those of the lower animals, we turn our attention to the history of our own species, innumerable lessons present themselves for the instruction of all who reflect seriously on the great concerns of human life. These lessons require, indeed, an uncommon degree of acuteness and good sense to collect them, and a still more uncommon degree of caution to apply them to practice; not only because it is difficult to find cases in which the combinations of circumstances are exactly the same, but because *the peculiarities of individual character are infinite*, and the real springs of action in our fellow-creatures are objects only of vague and doubtful conjecture. It is, however, a curious fact, and one which opens a wide field of interesting speculation, that, *in proportion as we extend our views from particulars to generals, and from individuals to communities, human affairs exhibit more and more, a steady subject of philosophical examination, and furnish a greater number of general conclusions* to guide our conjectures concerning future contingencies. To speculate concerning the character or talents of the individual who shall possess the throne of a particular kingdom a hundred years hence, would be absurd in the extreme: but to indulge imagination in anticipating, at the same distance of time, the condition and character of any great nation, with whose manners and political situation we are well acquainted, (although

even here our conclusions may be widely erroneous,) could not be justly censured as a misapplication of our faculties equally vain and irrational with the former. On this subject Mr. Hume has made some very ingenious and important remarks in the beginning of his Essay on the Rise and Progress of the Arts and Sciences.*

Uniformity in the general result preserved amidst unbounded variety in the particulars.—The same observation is applicable

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* [The following is the passage referred to.

"Nothing requires greater nicety, in our inquiries concerning human affairs, than to distinguish exactly what is owing to *chance*, and what proceeds from *causes;* nor is there any subject in which an author is more liable to deceive himself by false subtilties and refinements. To say that any event is derived from chance, cuts short all further inquiry concerning it, and leaves the writer in the same state of ignorance with the rest of mankind. But when the event is supposed to proceed from certain and stable causes, he may then display his ingenuity in assigning these causes; and as a man of any subtilty can never be at any loss in this particular, he has thereby an opportunity of swelling his volumes, and discovering his profound knowledge in observing what escapes the vulgar and ignorant.

"The distinguishing between chance and causes must depend upon every particular man's sagacity in considering every particular incident. But if I were to assign any general rule to help us in applying this distinction, it would be the following: *What depends upon a few persons is, in a great measure, to be ascribed to chance; what arises from a great number may often be accounted for by determinate and known causes.*

"Two natural reasons may be assigned for this rule. *First,* if you suppose a die to have any bias, however small, to a particular side, this bias, though perhaps it may not appear in a few throws, will certainly prevail in a great number, and will cast the balance entirely to that side. In like manner, when any *causes* beget a particular inclination or passion, at a certain time, and among a certain people, though many individuals may escape the contagion, and be ruled by passions peculiar to themselves, yet the multitude will certainly be seized by the common affection, and be governed by it in all their actions.

"*Secondly,* those principles or causes which are fitted to operate on a multitude, are always of a grosser and more stubborn nature, less subject to accidents, and less influenced by whim and private fancy, than those which operate on a few only. The latter are commonly so delicate and refined, that the smallest incident in the health, education, or fortune of a particular person, is sufficient to divert their course and retard their operato all other cases in which events depend on a multiplicity of circumstances. How accidental soever these circumstances may appear, and how much soever they may be placed, when individually considered, beyond the reach of our calculations, experience shows, that they are somehow or other mutually adjusted, so as to produce a certain degree of uniformity in the result, and this uniformity is the more complete, the greater is the number of circumstances combined. What can appear more uncertain than the proportion between the sexes among the children of any one family? and yet how wonderfully is the bal-

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tion; nor is it possible to reduce them to any general maxims or observations. Their influence at one time will never assure us concerning their influence at another, even though all the general circumstances should be the same in both cases.

"To judge by this rule, the domestic and the gradual revolutions of a state must be a more proper subject of reasoning and observation than the foreign and the violent, which are commonly produced by single persons, and are more influenced by whim, folly, or caprice, than by general passions and interests. The depression of the Lords, and the rise of the Commons in England, after the statutes of alienation and the increase of trade and industry, are more easily accounted for by general principles, than the depression of the Spanish and rise of the French monarchy after the death of Charles Quint. Had Harry IV., Cardinal Richelieu, and Louis XIV. been Spaniards, and Philip II., Philip III., Philip IV., and Charles II. been Frenchmen, the history of these two nations had been entirely reversed.

"For the same reason, it is more easy to account for the rise and progress of commerce in any kingdom, than for that of learning; and a state, which should apply itself to the encouragement of one, would be more assured of success than one which should cultivate the other. Avarice, or the desire of gain, is an universal passion, which operates at all times, in all places, and upon all persons; but curiosity, or the love of knowledge, has a very limited influence, and requires youth, leisure, education, genius, and example to make it govern any person. You will never want booksellers, while there are buyers of books; but there may frequently be readers, where there are no authors. Multitudes of people, necessity, and liberty have begotten commerce in Holland; but study and application have scarcely produced any eminent writers." — Hume's *Works,* III. 119-121.

As society is composed only of individuals, the movements and aspects of society could not be predicted, if the actions of the individual members ance preserved in the case of a numerous society! What more precarious than the duration of life in an individual? and yet, in a long list of persons of the same age, and placed in the same circumstances, the mean duration of life is found to vary within very narrow limits. In an extensive district, too, a considerable degree of regularity may sometimes be traced for a course of years, in the proportion of births and of deaths to the number of the whole inhabitants. Thus, in France, Necker informs us, that "the number of births is in proportion to that of the inhabitants as one to twenty-three and twenty-four, in the districts that are not favored by nature, nor by moral circumstances; this proportion is as one to twenty-five, twenty-

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were not, at least in certain respects, subject to law. The reality and the possibility of such sciences as politics and political economy, depend on the known facts, that the actions of men are influenced by motives, that there are certain leading motives, such as the desire of life, health, freedom, and property, which are common to all men, and therefore that the conduct of men on certain occasions, and to a certain extent, can be anticipated with full confidence that the prediction will be justified by the result. Were it not so, no general maxims could be established in political or social science, and no lessons could be derived from history. The conduct of men offers the same combination of uniformity with variety, of unity of principle underlying innumerable differences of detail, which is seen in the works of God in the external universe. According as the observer stands nearer or further off, according as his object is to arrange and classify for the purposes of science, or to particularize for the sake of description, so will he be more struck with the evidences of order and uniformity, or with those of diversity and fluctuation. Look at great masses of men only from a distance, at which minute peculiarities are lost in the general effects, (just as the sounds from a distant city are blended in one hollow murmur,) and they appear like machines, or rather the multitude itself seems one great machine. But examine microscopically the conduct of an individual for two successive hours, and it appears a mass of inconsistencies, motiveless alterations, and oddities that baffle all computation and foresight. The *will* alone, it is true, is changeful and irregular, its very caprice indicating its freedom; but *will*, when influenced by some ruling passion and enlightened by reason, is comparatively steady and uniform in its operations; and *will* enlightened by infinite wisdom, we may presume, knows no change of purpose or shifting of means, but reconciles perfect order with endless variety. And such is the character, both of the material and moral universe.]

five and a half, and twenty-six, in the greatest part of France; in cities, as one to twenty-seven, twenty-eight, twenty-nine, and even thirty, according to their extent and their trade." "Such proportions," he observes, "can only be remarked in districts where there are no settlers nor emigrants; but even the differences arising from these (the same author adds), and many other causes, acquire a kind of uniformity, when collectively considered, and in the immense extent of so great a kingdom."

It may be worth while to remark, that it is on these principles that all the different institutions for *assurances* [*insurance*] are founded. The object at which they all aim, in common, is, to diminish the number of accidents to which human life is exposed, or rather to counteract the inconveniences resulting from the irregularity of individual events, by the uniformity of general laws.

The idea of a great cycle in the order of events.—The advantages which we derive from such general conclusions as we possess concerning the order of nature are so great, and our propensity to believe in its existence is so strong, that, even in cases where the succession of events appears the most anomalous, we are apt to suspect the operation of fixed and constant laws, though we may be unable to trace them. The vulgar, in all countries, perhaps, have a propensity to imagine, that, *after a certain number of years, the succession of plentiful and of scanty harvests begins again to be repeated in the same series as before*, a notion to which Lord Bacon himself has given some countenance in the following passage: "There is a toy which I have heard, and I would not have it given over, but waited upon a little. They say it is observed in the Low Countries, (I know not in what part,) that every five-and-thirty years, the same kind and suite of years and weathers comes about again; as great frosts, great wet, great droughts, warm winters, summers with little heat, and the like; and they call it *the prime*. It is a thing I do the rather mention, because, computing backwards, I have found some concurrence."

Among the philosophers of antiquity, the influence of the same prejudice is observable on a scale still greater, many of them having supposed, that at the end of the *annus magnus*, or Platonic year, a repetition would commence of all the transactions that have occurred on the theatre of the world. According to this doctrine, the predictions in Virgil's Pollio will, sooner or later, be literally accomplished: —

> "Alter erit tum Typhis, et altera quæ vehat Argo
> Delectos Heroas; erunt etiam altera bella;
> Atque iterum ad Trojam magnus mittetur Achilles."*
>
> ["And other Argos bear the chosen powers;
> New wars the bleeding nations shall destroy,
> And great Achilles find a second Troy."]

The *astronomical cycles* which the Greeks borrowed from the Egyptians and Chaldeans, when combined with that natural bias of the mind which I have just remarked, account sufficiently for this extension to the moral world, of ideas suggested by the order of physical phenomena.

Use made by the fatalists of this conjecture. — Nor is this hypothesis of a moral cycle, extravagant as it unquestionably is, without its partizans among modern theorists. The train of thought, indeed, by which they have been led to adopt it, is essentially different; but it probably received no small degree of countenance in their opinion, from the same bias which influenced the speculations of the ancients. It has been demonstrated by one of the most profound mathematicians of the present age, (M. de la Grange,) that all the irregularities arising from the mutual action of the planets are, by a combination of various arrangements, necessarily subjected to certain periodical laws, so as forever to secure the stability and order of the system. Of this sublime conclusion, it has been justly and beautifully observed, that "after Newton's theory of the elliptic orbits of the planets, La Grange's discovery of their periodical inequalities, is, without doubt, the noblest truth in physical astronomy; while, in respect of the doctrine of final causes, it may truly be regarded as the greatest of all." The theorists, however, to whom I at present allude, seem disposed to consider it in a very different light, and to employ it for purposes of a very different tendency. "Similar periods, it has been said, but of an extent that affright the imagination, probably regulate the modifications of the atmosphere; inasmuch as the same series of appearances must inevitably recur, whenever a coincidence of circumstances take place. The aggregate labors of men, indeed, may be supposed, at first sight, to alter the operation of natural causes, by continually transforming the face of our globe; but it must be recollected that, as the agency of animals is itself stimulated and determined solely by the influence of external objects, *the reactions of living beings are comprehended in the same necessary system;* and, consequently, that all the events within the immeasurable circuit of the universe, are the successive evolution of an extended series, which, at the return of some vast period, repeats its eternal round during the endless flux of time." *

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* "Tum efficitur," says Cicero, speaking of this period, "cum solis et lunæ, et quinque errantium ad eandem inter se, comparationem confectis omnium spatiis, est facta conversio. Quæ quàm longa sit, magna quæstio est; esse vero certam et definitam necesse est." [It is then effected, when the revolutions of the sun and moon and five planets being completed, they have come round to the same relative place with each other as before. How long this period may be, is a great question; but it must necessarily be a fixed and definite period.] — *De Nat. Deorum,* lib. ii. 74. "Hoc intervallo," Clavius observes, "quidam volunt, omnia quæcunque in mundo sunt, eodem ordine esse reditura, quo nunc cernuntur." [After this interval, some maintain, all things in the world will come round into the same order in which they are now.] — *Clav. Commentar. in Sphæram.*

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* The foregoing passage is transcribed from an article in the Monthly Review. I have neglected to mark the volume; but I think it is one of those published since 1800.

From some expressions in this quotation, it would seem that the writer considered it as now established by mathematical demonstration, not only that a provision is made for maintaining the order and the stability of the solar system; but that, after certain periods, all the changes arising from the mutual actions of the planets, begin again to be repeated over in an invariable and eternal round; — or rather, that all this is the result of the necessary properties of matter and of motion. The truth is, that this

On this very bold argument, considered in its connection with the scheme of necessity, I have nothing to observe here. I have mentioned it merely as an additional proof of that irresistible propensity to believe in the permanent order of physical events, which seems to form an original principle of the human constitution; — a belief essential to our existence in the world which we inhabit, as well as the foundation of all physical science; but *which we obviously extend far beyond the bounds authorized by sound philosophy, when we apply it, without any limitation, to that moral system*, which is distinguished by peculiar characteristics, so numerous and important, and for the accommodation of which, so many reasons entitle us to pre-

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assumption is quite unfounded, in point of fact; and that the astronomical discovery in question, affords not the slightest analogical presumption in favor of a moral cycle; — even on the supposition, that *the actions of the human race,* and the motions of the globes which they inhabit, were *both equally subjected to the laws of mechanism.*

The quotation which gave occasion to the foregoing stricture, induces me to add, before concluding this note, that when we speak of La Grange's Demonstration of the stability of the solar system, *it is by no means to be understood* that he has proved, by mathematical reasoning, *that this system never will, nor ever can, come to an end.* The amount of his truly sublime discovery is, that the system *does not,* as Newton imagined, *contain within itself,* like the workmanship of mortal hands, *the elements of its own decay;* and that, therefore, its final dissolution is to be looked for, not from the operation of physical causes, subjected to the calculations of astronomers, but from the will of that Almighty Being, by whose fiat it was at first called into existence. That this stability is a necessary consequence of the general laws by which we find the system to be governed, may, indeed, be assumed as a demonstrated proposition; but it must always be remembered, that *this necessity is only hypothetical or conditional,* being itself dependent on the continuance of laws, which may at pleasure be altered or suspended.

The whole of the argument in the text, on the permanence or stability of the order of nature, is manifestly to be understood with similar restrictions. It relates, *not to necessary, but to probable truths;* not to conclusions syllogistically deduced from abstract principles, but to future contingencies, which we are determined to expect by a fundamental law of belief adapted to the present scene of our speculations and actions.

sume, that the material universe, with all its constant and harmonious laws, was purposely arranged.

Popular superstitions founded on the uniformity of the laws of nature. — To a hasty and injudicious application of the same belief, in anticipating the future course of human affairs, might be traced a variety of popular superstitions, which have prevailed, in a greater or less degree, in all nations and ages; those superstitions, for example, which have given rise to the study of charms, of omens, of astrology, and the different arts of divination. But the argument has been already prosecuted as far as its connection with this part of the subject requires. For a fuller illustration of it, I refer to some remarks on page 217, on the superstitious observances which, among rude nations, are constantly found blended with the practice of physic; and which, contemptible and ludicrous as they seem, have an obvious foundation, during the infancy of human reason, in those important principles of our nature, which, when duly disciplined by a more enlarged experience, lead to the sublime discoveries of inductive science.

Nor is it to the earlier stages of society, or to the lower classes of the people, that these superstitions are confined. Even in the most enlightened and refined periods, they occasionally appear; exercising, not unfrequently, over men of the highest genius and talents, an ascendant which is at once consolatory and humiliating to the species.

"Ecce fulgurum monitus, oraculorum præscita, aruspicum prædicta, atque etiam parva dictu in auguriis, sternutamenta et offensiones pedum. Divus Augustus lævum prodidit sibi calceum præpostere inductum, quo die seditione militari prope afflictus est." [Consider the warnings of thunder, the presages of oracles, the predictions of soothsayers, and even such insignificant circumstances in augury as sneezing and stumbling. The emperor Augustus said, he put on his left shoe instead of his right, on the day when he nearly perished in a mutiny.] (Plin. *Nat. Hist.* lib. ii.)

"Dr. Johnson," says his affectionate and very communicative biographer, "had another particularity, of which none of his friends ever ventured to ask an explanation. It appeared to me some superstitious habit, which he had contracted early, and from which he had never called upon his reason to disentangle him. This was his anxious care to go out or in at a door or passage, by a certain number of steps from a certain point, or at least, so as that either his right or his left foot (I am not certain which) should constantly make the first actual movement when he came close to the door or passage. Thus I conjecture; for I have, upon innumerable occasions, observed him suddenly stop, and then seem to count his steps with a deep earnestness; and when he had neglected or gone wrong in this sort of magical movement, I have seen him go back again, put himself in a proper posture to begin the ceremony, and having gone through it, break from his abstraction, walk briskly on, and join his companion."

The remark may appear somewhat out of place, but, after the last quotation, I may be permitted to say, that the person to whom it relates, great as his powers and splendid as his accomplishments undoubtedly were, was scarcely entitled to assert, that "Education is as well known, and has long been as well known, as ever it can be." What a limited estimate of the objects of education must this great man have formed! They who know the value of a well regulated and unclouded mind, would not incur the weakness and wretchedness exhibited in the foregoing description, for all his literary acquirements and literary fame.

3. *General remarks on the difference between the evidence of experience, and that of analogy.* — According to the account of *experience* which has been hitherto given, its evidence *reaches no further than to an anticipation of the future from the past, in cases where the same physical cause continues to operate in exactly the same circumstances.* That this statement is agreeable to the strict philosophical notion of experience, will not be disputed. Wherever a change takes place, either in the cause itself, or in the circumstances combined with it in our former trials, the anticipations which we form of the future cannot with propriety be referred to experience alone, but to experience coöperating

with some other principles of our nature. In common discourse, however, precision in the use of language is not to be expected, where logical or metaphysical ideas are at all concerned; and therefore, it is not to be wondered at, that the word *experience* should often be employed with a latitude greatly beyond what the former definition authorizes. When I transfer, for example, my conclusions concerning the descent of heavy bodies from one stone to another stone, or even from a stone to a leaden bullet, my inference might be said, with sufficient accuracy for the ordinary purposes of speech, to have the evidence of *experience* in its favor; if, indeed, it would not savor of scholastic affectation to aim at a more rigorous enunciation of the proposition. Nothing at the same time can be more evident than this, that the slightest shade of difference which tends to weaken the resemblance, or rather to destroy the identity of two cases, invalidates the inference from the one to the other, *as far as it rests on experience solely*, no less than the most prominent dissimilitudes which characterize the different kingdoms and departments of nature.

Upon what ground do I conclude that the thrust of a sword through my body, in a particular direction, would be followed by instant death? According to the popular use of language, the obvious answer would be, — upon experience, and experience alone. But surely this account of the matter is extremely loose and incorrect; for where is the evidence that the internal structure of my body bears any resemblance to that of any of the other bodies which have been hitherto examined by anatomists? It is no answer to this question to tell me, that the experience of these anatomists has ascertained a uniformity of structure in every human subject which has as yet been dissected; and that therefore I am justified in concluding, that my body forms no exception to the general rule. My question does not relate to the soundness of this inference, but to the principle of my nature, which leads me thus not only to reason from the past to the future, but to reason from one thing to another which, in its external marks, bears a certain degree of resemblance to it. Something more than experience, in the strictest sense of that word, is surely necessary to explain the transition from what is identically the same, to what is only similar; and yet my inference in this instance is made with the most assured and unqualified confidence in the infallibility of the result. No inference, founded on the most direct and long continued experience, nor indeed any proposition established by mathematical demonstration, could more imperiously command my assent.

In whatever manner the province of experience, strictly so called, comes to be thus enlarged, it is perfectly manifest, that without some provision for this purpose, the principles of our constitution would not have been duly adjusted to the scene in which we have to act. Were we not so formed as eagerly to seize the resembling features of different things and different events, and to extend our conclusions from the individual to the species, life would elapse before we had acquired the first rudiments of that knowledge which is essential to the preservation of our animal existence.

This step in the history of the human mind has been little, if at all, attended to by philosophers; and it is certainly not easy to explain, in a manner completely satisfactory, how it is made. The following hints seem to me to go a considerable way towards a solution of the difficulty.

How experience is made to extend to cases not precisely parallel. — It is remarked by Mr. Smith, in his considerations on the formation of languages, that the origin of genera and species, which is commonly represented in the schools as the effect of an intellectual process peculiarly mysterious and unintelligible, is a natural consequence of *our disposition to transfer to a new object the name of any other familiar object, which possesses such a degree of resemblance to it as to serve the memory for an associating tie between them.* It is in this manner, he has shown, and not by any formal or scientific exercise of abstraction, that, in the infancy of language, *proper names* are gradually transformed into *appellatives;* or, in other words, that individual things come to be referred to classes or assortments.

This remark becomes, in my opinion, much more luminous and important, by being combined with another very original one, which is ascribed to Turgot by Condorcet, and which I do not recollect to have seen taken notice of by any later writer on the human mind. According to the common doctrine of logicians, we are led to suppose, that *our knowledge begins in an accurate and minute acquaintance with the characteristical properties of individual objects;* and that it is only by the slow exercise of comparison and abstraction, that we attain to the notion of classes or genera. In opposition to this idea, it was a maxim of Turgot's, that some of *our most abstract and general notions are among the earliest which we form.* What meaning he annexed to this maxim, we are not informed; but if he understood it in the same sense in which I am disposed to interpret it, he appears to me entitled to the credit of a very valuable suggestion with respect to the natural progress of human knowledge. The truth is, that *our first perceptions lead us invariably to confound together things which have very little in common;* and that the specifical differences of individuals do not begin to be marked with precision, till the powers of observation and reasoning have attained to a certain degree of maturity. To a similar indistinctness of perception, are to be ascribed the mistakes about the most familiar appearances which we daily see committed by those domesticated animals with whose instincts and habits we have an opportunity of becoming intimately acquainted. As an instance of this, it is sufficient to mention the terror which a horse sometimes discovers in passing, on the road, a large stone, or the waterfall of a mill.

Two kinds of general notions.—Notwithstanding, however, the justness of this maxim, it is nevertheless true, that *every scientific classification must be founded on an examination and comparison of individuals.* These individuals must, in the first instance, have been observed with accuracy, before their specific characteristics could be rejected from the generic description, so as to limit the attention to the common qualities which it comprehends. What are usually called *general ideas,* or *general notions,* are therefore of two kinds, essentially different from each other; those which are general, merely from the vagueness and imperfection of our information; and those which have been methodically generalized, in the way explained by logicians, in consequence of an abstraction founded on a careful study of particulars. Philosophical precision requires, that two sets of notions, so totally dissimilar, should not be confounded together; and an attention to the distinction between them will be found to throw much light on various important steps in the natural history of the mind.*

Our disposition to confound things which are really different. — One obvious effect of the grossness and vagueness in the perceptions of the inexperienced observer, must necessarily be, to identify, under the same common appellations, immense multitudes of individuals, which the philosopher will afterwards find reason to distinguish carefully from each other; and as language, by its unavoidable reaction on thought, never fails to restore to it whatever imperfections it has once received, all the indistinctness which, in the case of individual observers, originated in an ill-informed judgment, or in a capricious fancy, comes afterwards, in succeeding ages, to be entailed on the infant understanding, in consequence of its incorporation with vernacular speech. These confused apprehensions produced by language must, it is easy to see, operate exactly in the same way as the undistinguishing perceptions of children or savages; the familiar use of a generic word insensibly and irresistibly leading the mind to extend its conclusions from the individual to the genus, and thus laying the foundation of conclusions and anticipations, which we suppose to rest on experience, when, in truth, experience has never been consulted.

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* The distinction above stated, furnishes what seems to me the true answer to an argument which Charron, and many other writers since his time, have drawn, in proof of the reasoning powers of brutes, from the universal conclusions which they appear to found on the observation of particulars. ["Brutes form general conclusions from particular objects; for, from the appearance of one man, they recognize all men."]

Instead of saying that brutes generalize things which are similar, would it not be nearer the truth to say, that they confound things which are different.

Many years after these observations were written, I had the satisfaction to meet with the following experimental confirmation of them in the Abbe Sicard's Course of Instruction for the Deaf and Dumb: ["I observed that Massieu preferred giving the same name, as a common name, to several individuals, among which he saw some points of resemblance; particular names supposed differences among them which he had not yet observed."] — (Sicard, pp. 30, 31.) The whole of the passage is well worth consulting.

In all such instances, it is worthy of observation, we proceed ultimately on the common principle, — that in similar circumstances, the same cause will produce the same effects; and when we err, the source of our error lies merely in identifying different cases which ought to be distinguished from each other. Great as may be the occasional inconveniences arising from this general principle thus misapplied, they bear no proportion to the essential advantages resulting from the disposition, in which they originate, to arrange and to classify; a disposition on which (as I have elsewhere shown) the intellectual improvement of the species in a great manner hinges. That the constitution of our nature in this respect is, on the whole, wisely ordered, as well as perfectly comformable to the general economy of our frame, will appear from a slight survey of some other principles, nearly allied to those which are at present under our consideration.

It has been remarked by some eminent writers in this part of the island, that our expectation of the continuance of the laws of nature has a very close affinity to our faith in human testimony. The parallel might perhaps be carried, without any over refinement, a little further than these writers have attempted; inasmuch as, in both cases, the instinctive principle is in the first instance unlimited, and requires, for its correction and regulation, the lessons of subsequent experience. As the credulity of children is originally without bounds, and is afterwards gradually checked by the examples which they occasionally meet with of human falsehood, so, in the infancy of our knowledge, whatever objects or events present to our senses a strong resemblance to each other, dispose us, without any very accurate examination of the minute details by which they may be really discriminated, to conclude with eagerness, that the experiments and observations which we make with respect to one individual, may be safely extended to the whole class. It is experience alone that teaches us caution in such inferences, and subjects the natural principle to the discipline prescribed by the rules of induction.

How this disposition is corrected. — It must not, however, be imagined, that, in instances of this sort, the instinctive principle always leads us astray; for the analogical anticipations which it disposes us to form, although they may not stand the test of a rigorous examination, may yet be sufficiently just for all the common purposes of life. It is natural, for example, that a man who has been educated in Europe should expect, when he changes his residence to any of the other quarters of the globe, to see heavy bodies fall downwards, and smoke to ascend, agreeably to the general laws to which he has been accustomed; and that he should take for granted, in providing the means of his subsistence, that the animals and vegetables which he has found to be salutary and nutritious in his native regions, possess the same qualities wherever they exhibit the same appearances. Nor are such expectations less useful than natural; for they are completely realized, as far as they minister to the gratification of our more urgent wants. It is only when we begin to indulge our curiosity with respect to those nicer details, which derive their interest from great refinement in the arts, or from a very advanced state of physical knowledge, that we discover our first conclusions, however just in the main, not to be mathematically exact; and are led by those habits which scientific pursuits communicate, to investigate the difference of circumstances to which the variety in the result is owing. After having found that heavy bodies fall downwards at the equator as they do in this island, the most obvious, and perhaps, on a superficial view of the question, the most reasonable, inference would be, that the same pendulum which swings seconds at London, will vibrate at the same rate under the line. In this instance, however, the theoretical inference is contradicted by the fact; — but the contradiction is attended with no practical inconvenience to the multitude, while, in the mind of the philosopher, it only serves to awaken his attention to the different circumstances of the two cases, and, in the last result, throws a new lustre on the simplicity and uniformity of that law, from which it seemed, at first sight, an anomalous deviation.

Illustration from the uniformity of the laws of grammar.—To this uniformity in the laws which regulate the order of physical events, there is something extremely similar in the systematical regularity (subject indeed to many exceptions) which, in every language, however imperfect, runs through the different classes of its words, in respect of their inflexions, forms of derivation, and other verbal filiations or affinities. How much this regularity or analogy (as it is called by grammarians), contributes to facilitate the acquisition of dead and foreign languages, every person, who has received a liberal education, knows from his own experience. Nor is it less manifest, that the same circumstance must contribute powerfully to aid the memories of children in learning to speak their mother-tongue. It is not my present business to trace the principles in the human mind by which it is produced. All that I would remark is, the very early period at which it is seized by children; as is strongly evinced by their disposition to push it a great deal too far, in their first attempts towards speech. This disposition seems to be closely connected with that which leads them to repose faith in testimony; and it also bears a striking resemblance to that which prompts them to extend their past experience to those objects and events of which they had not hitherto had any means of acquiring a direct knowledge. It is probable, indeed, that our expectation, in all these cases, has its origin in the same common principles of our nature; and it is certain, that, in all of them, it is subservient to the important purpose of facilitating the progress of the mind. Of this nobody can doubt, who considers for a moment, that the great end to be first accomplished was manifestly the communication of the general rule; the acquisition of the exceptions (a knowledge of which is but of secondary importance) being safely intrusted to the growing diligence and capacity of the learner.

The considerations now stated, may help us to conceive in what manner conclusions derived from experience come to be insensibly extended from the individual to the species; partly in consequence of the gross and undistinguishing nature of our first perceptions, and partly in consequence of the magical influence of a common name. They seem also to show, that this natural process of thought, though not always justified by a sound logic, is not without its use in the infancy of human knowledge.

4. *Evidence of testimony tacitly recognized as a ground of belief, in our most certain conclusions concerning contingent truths.* — In some of the conclusions which have been already under our consideration with respect to contingent truths, a species of evidence is admitted, of which no mention has hitherto been made; I mean the evidence of *testimony.* In astronomical calculations, for example, how few are the instances in which the data rest on the evidence of our own senses; and yet our confidence in the result is not, on that account, in the smallest degree weakened. On the contrary, what certainty can be more complete than that with which we look forward to an eclipse of the sun or the moon, on the faith of elements and of computations which we have never verified, and for the accuracy of which we have no ground of assurance whatever, but the scientific reputation of the writers from whom we have borrowed them. An astronomer who should affect any skepticism with respect to an event so predicted, would render himself no less an object of ridicule, than if he were disposed to cavil about the certainty of the sun's rising to-morrow.

Even in pure mathematics, a similar regard to testimony, accompanied with a similar faith in the faculties of others, is by no means uncommon. Who would scruple, in a geometrical investigation, to adopt as a link in the chain, a theorem of Apollonius or of Archimedes, although he might not have leisure at the moment to satisfy himself, by an actual examination of their demonstrations, that they had been guilty of no paralogism, either from accident or design, in the course of their reasonings?

Difference between the logical and the popular meaning of the word probability. — In our anticipations of astronomical phenomena, as well as in those which we form concerning the result of any familiar experiment in physics, philosophers are accustomed to speak of the event as only *probable*, although our confidence in its happening is not less complete than if it rested on the basis of mathematical demonstration. The word *probable*, therefore, when thus used, *does not imply any deficiency in the proof, but only marks the particular nature of that proof*, as contradistinguished from another species of evidence. It is opposed, not to what is certain, but to what admits of being demonstrated after the manner of mathematicians. This differs widely from the meaning annexed to the same word in popular discourse: according to which, whatever event is said to be *probable*, is understood to be expected with some degree of doubt. "As certain as death" — "as certain as the rising of the sun" — are proverbial modes of expression in all countries; and they are both of them, borrowed from events which, in philosophical language, are only probable or contingent. In like manner, the existence of the city of Pekin, and the reality of Cæsar's assassination, which the philosopher classes with probabilities, because they rest solely upon the evidence of testimony, are universally classed with certainties by the rest of mankind; and in any case but the statement of a logical theory, the application to such truths of the word *probable*, would be justly regarded as an impropriety of speech. This difference between the technical meaning of the word *probability*, as employed by logicians, and the notion usually attached to it in the business of life, together with the erroneous theories concerning the nature of demonstration, which I have already endeavored to refute, — have led many authors of the highest name, in some of the most important arguments which can employ human reason, to overlook that irresistible evidence which was placed before their eyes, in search of another mode of proof altogether unattainable in moral inquiries, and which, if it could be attained, would not be less liable to the cavils of skeptics.

But although, in philosophical language, the epithet *probable* be applied to events which are acknowledged to be certain, it is also applied to those events which are called probable by the vulgar. The philosophical meaning of the word, therefore, is more comprehensive than the popular; the former denoting that particular species of evidence of which contingent truths admit; the latter being confined to such degrees of this evidence as fall short of the highest. These different degrees of probability the philosopher considers as a series, beginning with *bare possibility*, and terminating in *that apprehended infallibility* with which the phrase *moral certainty* is synonymous. To this last term of the series, the word *probable* is, in its ordinary acceptation, plainly inapplicable.

The satisfaction which the astronomer derives from the exact coincidence, in point of time, between his theoretical predictions concerning the phenomena of the heavens, and the corresponding events when they actually occur, does not imply the smallest doubt, on his part, of the constancy of the laws of nature. It resolves partly into the pleasure of arriving at the knowledge of the same truth or of the same fact by different media; but chiefly into the gratifying assurance which he thus receives, of the correctness of his principles, and of the competency of the human faculties to these sublime investigations. What exquisite delight must La Place have felt, when, by deducing from the theory of gravitation the cause of the acceleration of the moon's mean motion — an acceleration which proceeds at the rate of little more than 11″ in a century, — he accounted, with such mathematical precision, for all the recorded observations of the place from the infancy of astronomical science! It is from the length and abstruseness, however, of the reasoning process, and from the powerful effect produced on the imagination, by a calculus which brings into immediate contrast with the immensity of time such evanescent elements as the fractional parts of a second, that the coincidence between the computation and the event appears in this instance so peculiarly striking. In other respects, our confidence in the future result